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Taxation Run Wild

THERE is one branch of the shipbuilding industry which in addition to sharing in the present general depression is further hindered by unjust and unreasonable taxation—in fact faces extinction unless early action is taken by Congress to right its wrongs and give it relief from the unreasonable and useless conditions which are now by law imposed upon it.

We refer to the yacht and boatbuilding industries. While yachting and boating are not commercial occupations, they form a most important national asset, particularly in their very material bearing upon the merchant marine and the navy. They form a link which cannot be replaced by other activities between the general public and the nation's maritime interests.

During the war a luxury tax of 10 percent was levied on all new pleasure vessels having a value of over $15 built in the United States and a further operating tax was assessed upon all boats when completed and in use—the only instance where such a double tax is imposed.

Furthermore, as the law now stands, any foreign built yacht or pleasure boat, if purchased by an American, is admitted to American registry, free of any import duty and of the 10 percent tax above mentioned provided only that she is navigated to the United States and not brought in as part of the cargo of another vessel.

As a result of these conditions, the construction of large yachts in this country has ceased and it is but a question of time when practically all boats capable of being navigated say from Halifax to Boston, will be built outside of the country.

It is hard to imagine a more unfair as well as futile and short sighted condition to impose upon an important and valuable industry.

Efforts have been made to have these taxes reduced or removed, but so far Congress has refused to act. The only reason for this attitude appears to be that in the mind of the average congressman a yacht must necessarily imply a rich owner and the tax forms a means of "getting at" him and therefore must be good. A very slight investigation shows that the tax has failed utterly to produce material revenue, has practically killed the business, and so far as the yacht owner is concerned, he merely gets his boat abroad and pays no duty or construction tax whatever.

So far as concerns the merchant marine, the opinions of different people as to the best means of aiding it may be expected to vary, but the conditions under which the boatbuilding industry is laboring are intolerable and it is unthinkable that any reasonable and fair minded man, when once he knows these conditions, should vote to keep them in force.

Ship and Engine Trials

WHEN one considers the enormous number of steamers in service the world over, the amount of really accurate knowledge extant as to the actual performance of these vessels and their machinery, from an engineering point of view, is almost ridiculously small.

For naval vessels, accurate data are generally secured and the designer of future ships knows, within relatively small limits, the relation that will obtain between model experiments and actual results as well as the fuel economy of the type of machinery adopted.

Turning to merchant practice, no such satisfactory condition exists. It is true that models are being towed more and more frequently, to determine the resistance of proposed commercial vessels, but in how many instances is a really satisfactory trial made of the completed vessels, and the efficiency of the hull, machinery and propellers actually determined?

The fact is now generally recognized that form has a much greater effect upon the resistance and propeller efficiency of vessels of low speed than was formerly believed to be the case. Much care and study are devoted to the lines and to lessening the resistance of commercial vessels, but it is well to remember that model resistance is only one factor in the problem, and until the relation of this factor to the performance of the actual ship is determined by careful trials of the

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latter, our work is largely in vain, and a really close calculation of the power for a new vessel impossible.

The contract date of completion for most ships is determined by a mental process in which "the wish is father to the thought." Delivery is always likely to be delayed and the hurried final trial usually demonstrates that the machinery will operate satisfactorily, and not much else.

If the model data are considered worth time and money to obtain, is not a careful trial which gives to this data a real, instead of just an apparent value, equally worth while?

A somewhat similar condition exists with respect to the economy of machinery; for while the steam consumption of an ordinary reciprocating engine or of a steam turbine can be predicted with considerable certainty and the evaporative efficiency of any standard type of boiler is pretty accurately known, not nearly so much data are available in regard to the installation as a whole with its many pumps and other auxiliaries and the losses arising from radiation, pressure drop and other conditions inseparable from a steam plant.

Unfortunately, accurate tests of steam and fuel consumption are expensive, both in time and money, and in the case of merchant vessels are, for the present at least, practically out of the question.

Vessels belonging to the Government, however, are occasionally submitted to an exhaustive trial. Such a trial is that of the Coast Guard cutter *Modoc*, which was described at length in a paper read by Captain Q. B. Newman, of the United States Coast Guard, before the Society of Naval Architects and Marine Engineers at its November meeting. Aside from the interest of this paper as describing the performance of a novel form of propelling machinery, the data obtained relative to the economy of the various auxiliaries are of the greatest value to the profession in general, and the test was conducted in such a thorough and painstaking manner that it may well be taken as a model for similar work in the future.

We certainly hope that the time will come when private shipowners may feel that such tests can be undertaken to advantage, and that research work of this character is of sufficient value to warrant the expense involved. The results of such work, if carefully carried out, would be invaluable to both the shipbuilder and the shipowner and the economies effected as a result of more certain knowledge of operation as well as of design should well repay the money and time necessary to obtain them.

The Present Status of the Marine Diesel Engine

THE development of the Diesel engine and the rapid expansion of its application to marine uses has, without a doubt, been the most important factor on the technical side of shipping affairs during the past decade.

Since the first application of this type of machinery to ship propulsion, about 1910, no year has shown strides comparable with those made during 1923, nor held out the promise of future expansion along this line which now exists. Not only has the application of various types of heavy oil engines to the propulsion of cargo vessels rapidly progressed, but radical developments in design and improvements in material have made certain the successful operation of Diesel engines in large, high powered ships in the immediate future.

In the early stages of Diesel design the problem of increasing power, other than by a multiplication of cylinders and higher revolutions, appeared to present almost insurmountable difficulties. The extremely high pressures and temperatures involved in the operation of these engines, together with the fact that as cylinder sizes increased, production of heat, as represented by the cylinder volume mounted much more rapidly than the capacity for heat transference as represented by the area of the cylinder walls, seemed to indicate that a limit in the size of cylinders would be very quickly reached and that the practical application of this type of propelling machinery would be limited to relatively small powers and to revolution rates higher than can economically be used in ordinary single screw cargo ships of low speed.

But, as has often been found in the past, practical application and research have found ways of meeting and surmounting the theoretical barriers to progress, and while the basic principles involved no doubt remain unchanged, the conclusions to be drawn from them, thanks to improvement in both design and materials, are quite different from those obtaining ten years ago.

Considered as a whole, Diesel engines are well through the experimental stage, and a number of the single acting type of powers up to 2,500 shaft horsepower have been developed, both two and four cycle, which may be accepted with entire confidence of satisfactory performance. Furthermore, in view of the relatively low rate of revolutions which have been attained by certain of these engines, they can be depended upon to give at least as high a degree of propulsive efficiency as steam machinery of the same power and the claim, formerly made, that Diesels were only practicable with twin screws or in small single screw ships having propellers of relatively small diameter is no longer tenable.

In this connection it should be borne in mind that Diesel engines, aside from their overwhelming superiority over steam machinery in the matter of fuel economy, have a further and very definite advantage over the latter in the maintenance of speed at sea, under service conditions.

Steam machinery, particularly when coal is used for fuel, is largely dependent upon the fireman for the maintenance of power and speed, and even with oil fuel the human element enters very largely into the problem. On the other hand, the fuel supply of Diesel engines is automatic and the power developed remains constant, once the rate of fuel delivery to the cylinders is fixed. Furthermore, the action of the governor is practically instantaneous on all cylinders of a Diesel, while in a steam engine the reduction of power following racing and the return to normal revolution after the racing has been overcome is a relatively slow process, with the result that steamers show a lower average speed in rough weather than motorships of the same effective power.

Turning to the adoption of internal combustion engines for vessels of comparatively high power and speeds, the main factor in the problem is the production of greater power per unit of weight and space available for propelling ma-

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chinery. With the present limit of practicable single acting engines set at about 3,500 indicated horsepower for each unit, it is obvious that to produce the power required by large, high speed passenger liners a radically different type of engine is necessary. This condition has led to the development of the double acting engine. The application of the double acting principle to Diesel engines is, however, by no means new. In 1910 the M.A.N. Works at Nürnberg undertook the construction of a single cylinder experimental engine of this type having an indicated horsepower of approximately 2,600. While this was a long step in advance of anything which had been previously attempted, it must be remembered that very large double acting gas engines had been in satisfactory operation for a considerable period previous to 1910 and in the light of this fact the attempt to produce a large Diesel engine was an entirely logical and reasonable step. Considerable difficulty was experienced from the cracking of cylinder castings due apparently to their inability to satisfactorily handle the enormous amount of heat developed and in 1912 the engine was destroyed by an explosion caused by lubricating oil finding its way into the scavenging air piping.

Notwithstanding the accident, the development of a new design was proceeded with and in 1917 a six cylinder engine, developing about 12,000 brake horsepower was successfully produced. This engine was later dismantled so that the results, aside from showing the possibility of constructing a workable two-cycle Diesel of large power, were inconclusive and gave little indication as to what might be expected of the engine in long continued service.

In the meantime other builders were experimenting with double acting engines so that the demand for increased power finds this phase of Diesel development in an advanced stage. There are at the present time two double acting engines of very widely different types which have actually been run for long periods and give great promise of satisfactory operation on board ship. Of these two engines, one is of the four-cycle type and has been developed by Burmeister & Wain, who have had by far the greatest experience of any builders in the production of successful single acting marine engines. Such is the confidence of the builders in this engine that contracts have been entered into to install it on four large vessels having an aggregate gross tonnage of approximately 80,000; with the power of some of the individual engines concerned running up to 10,000 indicated horsepower.

The other engine has been built by the North British Diesel Engine Works of Glasgow and is a two-cycle engine of most unusual design, the control of scavenging and exhaust being accomplished by the combined movement of the cylinders and pistons. Nothwithstanding the many novelties involved in its construction, this engine has performed very satisfactorily under severe test conditions and it furthermore embodies several unique features, among them being the practical absence of valve gear and cam shaft, the freedom of the cylinder liners from excessive heat strains and, what is of more general interest, the small weight and space taken up for the power developed.

The actual trial of these engines at sea is awaited with much interest by both engineers and shipowners for the Diesel, more perhaps than any other prime mover, can be justly appraised only after its ability to stand up under long periods of sea service has been demonstrated. The long ex-

The Navy That Keeps Peace

THE pacifists and the little-navy men in Congress are combining to defeat an appropriation of $30,000,000 to modernize the fleet.

They set up the plea that such a program "involves a breach of the navy limitation treaty negotiated at the arms conference."

It is difficult to write with patience of such an attempt to break down the armed defenses of this great nation on the seas.

When the arms conference treaties were written, the American people were told that they left the United States navy the equal of the British fleet and superior to the Japanese navy in a ratio of five to three.

That statement was not true. But so powerful was the propaganda of those who, with alien help, had framed the compacts that the Senate ratified them.

The British and Japanese governments have felt no hesitation about improving the offensive and defensive characteristics of their fighting ships. It would be suicidal for the American government to remain blind to this fact and to refuse to keep its navy, as far as possible, up to the same standard.

Europe and Asia are preparing for war. We alone refuse to see the perils that lie in the pathway of every great and growing nation. Our pacifists foolishly believe that because we gave a few millions to the Japanese who suffered in last year's earthquake disaster, that we have thereby bought the Japanese good will and can therefore ignore the fact that Japan is spending far more millions on its navy, its army and its air fleet.

We lent billions to France, to save that nation from destruction. But there is none insane enough to assert today that we thereby bought enough French good will to halt that nation for twenty-four hours if its interest should ever run counter to the interest of the United States.

The American navy is the best guardian of peace today—our peace and the peace of the world. It would be treason to cripple its power.—*The Chicago Herald and Examiner.*

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perience with Diesel machinery which the designers and builders of both these engines have had, however, gives good promise of their successful operation.

With the technical problems incident to the adoption of internal combustion engines in ships of widely varying powers in a fair way of complete and satisfactory solution, there remain the questions of practical operation and of cost to be met and effectively answered. So far as operation is concerned, the questions of oil supply and the difficulty of procuring engineers trained in the operation of Diesel engines appear to be the most important that have been raised. Aside from the fact that motorships have a much greater radius of action than steamers and, consequently, need to have their bunkers replenished much less frequently, the world's oil supply appears to be sufficient for all possible requirements for many years to come and oiling stations are being so rapidly developed along the principal lines of trade, that the limitations to the operation of motorships arising from this source are being speedily extended and without doubt in the future will be practically removed.

The training of competent engineers is a rather vital problem at present, but there seems to be no reason why a good seagoing steam engineer cannot, with a relatively short experience, become equally expert in the operation of Diesel machinery and as both builders and operators of motorships are using all their resources to train men it seems reasonable to expect that an adequate supply of engineers will be forthcoming to meet the rising demand.

Coming finally to purely financial considerations, we find in their high first cost the main barrier to the general adoption of Diesel engines which at present exists. The determination of the additional investment he is warranted in making in order to realize the many advantages possessed by the motorship rests with the shipowner. It is not surprising that with the present depressed condition of seaborne trade, and the resultant spirit of pessimism which has prevailed in shipping circles, the shipowner hesitates to make the large additional investment necessary to motorship construction and it does not seem probable that there will be any extensive building of this class of vessel, at any rate in this country, until there is a marked improvement in trade prospects or until the first cost of motorships is reduced to a point where the shipowner is fairly well assured that the reduced cost of operation will at least balance the increased capital charges.

The reduction in cost of Diesel engines may result from both improvements in design and increased production.

Including in the province of design the use of improved materials and the standardization of parts as well as actual improvement in arrangements and details, it is evident that there exists under this heading a broad field for possible development and simplification all tending to a reduction of costs. In view of the fact that, as has been pointed out, remarkable progress has already been made in materials and design, there is every reason to feel confidence in the ultimate success of the efforts now under way to increase the unit output of Diesel engines and realize a corresponding reduction in their cost per horsepower.

There seems no probability of a general standardization of type for a long time to come. It can only be determined by the ship operator as the result of extended practical experience with the different engines in various trades, and it may well develop that certain types are peculiarly adapted to certain services, and that no one design is equally suitable for all different lines of trade. So far as the development of power is concerned, we are inclined to believe that it will eventually be found that the ability of the material to stand up under service, rather than the general design and cycle upon which the engine operates, limits the practicable unit output and that the power per unit of weight, as determined by long periods of operation, will not vary as greatly between the different types of engines as now seems to be generally believed.

It is in the field of quantity or mass production that we believe the greatest saving in cost can at the present time be effected. Up to now, such large Diesels as have been built in this country have been on a strictly "made-to-order" basis and their great cost bears but a distant relation to what might be accomplished if duplication were possible. It is very generally admitted that this type of machinery can only be satisfactorily and economically produced in shops specially arranged and fitted for the purpose but until there is a marked demand engine builders are not warranted in making the outlay which the equipment of such shops involves.

The peculiar situation which exists in the country as regards shipping, while deplorable when viewed from most angles, offers a unique opportunity for overcoming this greatest difficulty lying in the way of extended adoption of Diesel engines. By making available for conversion purposes the construction loan fund now held by the Shipping Board and thus enabling the Board to proceed immediately with the installation of these engines in a number of ships, Congress will, at one stroke, perform a service of greater constructive value to American shipping than anything heretofore accomplished. Not only will the country be placed in possession of vessels of the highest competitive value but, what is more important, the builders of Diesel engines will be enabled to place their business on a "quantity" basis and thus to overcome the greatest obstacle to cheapening production.

The question of type and possible future developments enters but little into the present situation. For the relatively low powers demanded by the Shipping Board vessels there are several engines which have had the benefit of extended service and which may be confidently expected to give satisfactory results. By assigning a group of ships to the builders of each of these successful engines, the business as a whole will be placed on a stable basis and opportunity will be given to determine the fitness of each type for certain lines of trade.

Furthermore, by installing in certain vessels, double acting engines, such as we have mentioned, opportunity would be given for testing under service conditions, this most advanced type of Diesel machinery as well as determining the increase in deadweight and cubic cargo capacity which it is claimed will result from its adoption.

Altogether there is a wonderful opportunity for constructive action and there seems to be no good reason why Congress should not act favorably and promptly in this matter. We trust that the entire shipowning and shipbuilding interests of the country will work together and pool their efforts to the end that this altogether desirable legislation may be speedily enacted.

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One-Man Control for the Government Fleet

Rear-Admiral Palmer Elected President of the Emergency Fleet Corporation—Opposition to the Chairman of the Shipping Board

By Harold F. Lane

WASHINGTON, D. C.

THE United States Shipping Board and the operation of the Government's fleet of vessels are undergoing another reorganization as the result of the refusal of the Senate Committee on Commerce in December, by an unanimous vote, to recommend to the Senate the confirmation of President Coolidge's nomination of Edward P. Farley for reappointment as chairman of the board. The President then withdrew the appointment, as well as those of Commissioners Thompson and Haney, so that he might have an opportunity to consider the entire situation before making a selection for chairman and a series of conferences which ensued led to his accepting the recommendation of Senator Wesley L. Jones of Washington that the affairs of the Emergency Fleet Corporation be separated from those of the board. Under this plan former Admiral Leigh C. Palmer was elected president of the Fleet Corporation on January 7 and it is understood has been given full authority, subject to the general control and supervision of the Shipping Board, which is now to function more as a regulating body somewhat like the Interstate Commerce Commission in its relation to the railroads.

Chairman Farley has resigned and no appointment as his successor as chairman has yet been announced, although President Coolidge has re-nominated Commissioner Thompson and has indicated that he will take similar action with reference to Commissioner Haney.

WHY FARLEY'S NOMINATION WAS OPPOSED

In opposing the Farley nomination the Senate committee took the position that, as a resident of Chicago, he was not qualified from the standpoint of the geographical distribution of members of the Shipping Board prescribed by the law and that since there is already one member of the board from the states bordering on the Great Lakes, Commissioner O'Connor, of Buffalo, a resident of another lake port was not qualified, as a representative of the interior. President Coolidge, in nominating Mr. Farley for reappointment, after he had been given a recess appointment by President Harding, took the position that he was merely following the precedent set by the appointment of former Chairman A. D. Lasker of Chicago as the member from the interior and it was pointed out at the White House that the geographical question was never raised in connection with Mr. Lasker's appointment.

It is generally understood, however, that the question of geography merely represented a convenient way for the members of the committee to express their general opposition to Mr. Farley, and the attitude he has taken in advocating plans for the operation of the Government fleet by subsidiary corporations of the Emergency Fleet Corporation. In advocating this policy Mr. Farley had also encountered opposition among the members of the board. Objection to Mr. Farley also arose in some instances from the fact that he was regarded as a representative of Mr. Lasker and those who did not like Lasker's methods and practices transferred their objections to his successor.

Some opposition to reappointment of Chairman Farley also grew out of desire on the part of certain western Senators to have a representative of agriculture on the board. Senator Ladd of North Dakota was one of the leaders in a movement for a representative of agriculture as the interior member of the board.

The decision to place Admiral Palmer at the head of the Government fleet was announced by Senator Jones on January 3 after a conference at the White House attended by members of the Shipping Board, Senator Jones, Senator Fletcher, Chairman Greene of the House Committee on Merchant Marine and Representative Edmonds. It was stated that he would be elected at the suggestion of the President and that a plan had been agreed upon at the conference for a separation of the board from the corporation under a resolution adopted by the board while Chairman Lasker was in office but which had been departed from when Mr. Farley was elected also president of the Fleet Corporation. This decision, it was said, made less important the question of a selection of a man for the chairmanship.

There was some delay due to differences of opinion among members of the board, in the passage of the resolution delegating powers to the corporation and there were rumors for a time that there was some controversy as to the extent of the powers to be conferred on the head of the fleet. The resolution finally adopted was not made public but it was authoritatively stated at the White House that it did not really mean a change in policy because it was in accord with the resolution previously adopted; that it would curtail some of the powers of the board with respect to the operation of the fleet, while leaving it its functions as a regulatory body under a relationship to the fleet about the same as that between the Interstate Commerce Commission and the railroads. Mr. Palmer had indicated that he would not accept the position unless under all the authority necessary for full and free operation of the fleet but it was later explained at the White House that this had been accomplished, without divesting the board of any of the authority or responsibility conferred upon it by Congress by obtaining assurances from individual members of the board that Mr. Palmer's appointment was acceptable and that they would support him under a relationship similar to that of owner and manager. The plan was approved by the President and accepted by Mr. Palmer on January 10.

SENATOR JONES' RECOMMENDATIONS

The plan agreed upon is in accord with the recommendation made to the President by Senator Jones on December 28 in which he said in part:

"Much fault is found with the management of our ships by the Shipping Board and it is sought to give its powers, duties and property to one man, or some organization headed by one man. The physical property of the board, the sale and operation of the ships, should be under an unified control and head, but the primary powers and duties of the board should not be placed in one man no more than the powers and duties of the Interstate Commerce Commission should be so placed. The Shipping Board was primarily created to exercise a control over shipping, very similar to that exercised by the Interstate Commerce Commission over railroads. This purpose is largely overlooked and with the burdens placed upon the Shipping Board by the war it has scarcely functioned as it was primarily intended to function. I think the time has come for it to do so. No new legislation or new organization is necessary to bring this about and secure an unified control over the ships. The acts of 1916 and 1920 contemplate this very thing.

"The act of 1916 defines the primary duties and powers of the board. It provided for the expenditure of fifty millions of dollars for building ships, but it did not contemplate that the board would operate and deal directly with these ships, but it authorized the organization of a corporation for that purpose.

"The act of 1920 took into account the fact that, instead of

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having fifty millions in ships to deal with, we had over three billions so invested, and we extended the life of the Emergency Fleet Corporation indefinitely, and provided in section 35:

"'Sec. 35. That the power and authority vested in the board by this act, except as herein otherwise specifically provided, may be exercised directly by the board, or by it through the United States Shipping Board Emergency Fleet Corporation.'

"I have not examined the act of 1920, particularly, to ascertain what powers and authority is specifically placed in the board that it cannot exercise through the Fleet Corporation, but only one provision occurs to me, and that is the provision where an affirmative vote of not less than five members of the board is required to sanction a certain course, and this relates to the sale of our ships to aliens. Practically all the power and authority of the board over the physical property in its control can be delegated to the Emergency Fleet Corporation, and this should be done under an irrevocable rule or order made by the board. That corporation should be organized wholly independent of the board. Not a single member of the Shipping Board should be on its board of trustees. This corporation should have the force of high-salaried men which Congress has provided for dealing with the shipping property, and it should handle the ships and property just like any other corporation would handle them. Let a man like Mr. Rossbottom be made general manager, and through proper bylaws give him the authority which a general manager of such a business usually has, and we will have the unified control sought by so many and that is absolutely necessary for the most successful handling of such a vast and complicated business. The Shipping Board should now turn its attention to the discharge of its duties and the exercise of the powers devolved upon it by the acts of 1916 and 1920."

Senator Jones also said:

"A committee should be appointed to work out a plan that will bring about closer cooperation between and a better coordination of rail and water transportation. This I believe to be vital, and, if closer coordination can be brought about, it will do more to develop our merchant marine than any other one thing. If I may, I would suggest as such a committee the chairman of the shipping board, chairman of the Interstate Commerce Commission, and the Secretary of Commerce, with possibly an expert rail man, shipping man and representatives from business, labor and agricultural interests. I doubt the wisdom of having the legislative branch represented upon this committee. It should do its work, formulate its plans and make its recommendations uninfluenced by legislative considerations, and if legislation should be necessary let Congress take its recommendations and assume the responsibility of approving or rejecting them.

Replacement Plan Needed

"There is another need that is vital. If we are to have a permanent merchant marine a careful and expert survey of our commercial and defense shipping needs should be made to determine at least the minimum of ships we must have and to what extent new and modern ships must be provided. Our ships are deteriorating fast. A plan of replacement must be formulated, approved and entered upon without delay. If private capital does not take over the routes we are operating and building ships to take the place of those that become obsolete, the government must do it, or we will soon revert to the place on the sea we had when the war broke out. If the condition of these services is uncertain, business will not wait for our ships to stop running, but will inevitably go to our competitors ahead of their decay. Congress has solemnly declared it 'to be the policy of the United States to do whatever may be necessary to develop and encourage the maintenance' of a merchant marine 'of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency.' A special committee should be set up to make this survey, formulate a policy and submit a detailed plan with the cost, if it must be carried out by the government, so that you may be in a position to make a concrete recommendation to Congress. This committee should be made up of one or more representatives of the Shipping Board and the Secretaries of War, Navy and Commerce."

Palmer to Keep a Strong Fleet on the Seas

Mr. Palmer said he intended to carry out his authority "with a definite idea that a strong and efficient merchant marine is to be kept on the seas" and that a merchant marine should be developed on a foundation which will make it a permanent and most important part of the nation's business. There must be sufficient tonnage, he said, to handle a fair share of our exports and imports and at the same time be a most necessary and valuable part of the national defense.

Shipping Legislation Proposed

WASHINGTON, D. C.

ALTHOUGH Congress has accomplished practically nothing since the season opened on December 4, the committees in both the Senate and House that will handle marine legislation have been organized and numerous bills have been introduced. Senator Jones of Washington continues as chairman of the Senate committee on commerce and the other members are Senators Fernald, McNary, Edge, Willis, Weller, Ball, Ladd, Couzens, Fletcher, Ransdell, Sheppard, Simmons, Dial, Ferris and Stephens. Representative William S. Greene continues as chairman of the House committee on merchant marine and fisheries and the other members are Representatives Edmonds, Pa.; Scott, Mich.; White, Me.; Lehlbach, N. J.; Rosenbloom, W. Va.; Free, Cal.; Roach, Mo.; Brand, Ohio; Reid, Ill.; Wertz, Pa.; Bacon, N. Y.; Sutherland, Alaska; Larazo, La.; Davis, Tenn.; Bland, Va.; Briggs, Tex.; Larsen, Ga.; McKeown, Okla.; Lindsay, N. Y.; Croll, Pa., and O'Connell, R. I.

Senator Jones has introduced three bills, S. 482, 485 and 487, designed to give aid to the American merchant marine. One of the bills provides for 5 percent additional duty on dutiable imports brought in foreign vessels and for a duty of 2½ percent ad valorem on non-dutiable imports if brought in foreign vessels.

Senator Caraway has introduced a bill, S. 600, providing for the charter of Shipping Board vessels upon application made by any state, municipality, or other political subdivision thereof prior to February 1, 1924, upon an agreement to operate the vessels in a service designated by the Shipping Board, keep them in repair and meet all charges. Senator King of Utah has introduced a resolution, Senate Resolution 53, requiring the Shipping Board to furnish a varied amount of information. Senator Jones has also introduced a resolution to permit the use of the construction and loan fund for reconditioning existing vessels.

Senator Edge has introduced a bill, S. 1492, to reduce the number of commissioners of the Shipping Board. Senator King has introduced a bill, S. 990, to transfer to the Secretary of Commerce the powers, duties and functions of the Shipping Board and the property of the Emergency Fleet Corporation. Senator Jones has also introduced a bill, S. 729, to repeal the act of August 18, 1914, which provides for the admission of foreign-built vessels to American registry for the foreign trade. Senator McKellar has introduced a resolution, S. Res. 17, directing the Shipping Board to report to the Senate answers to 15 questions bearing on the sale of liquor on Shipping Board vessels.

Representative Fairchild has introduced a bill H. R. 3911, "for the restoration of the long-continued and successful American policy of discriminating import duties and tonnage dues for the protection of American ships and their prosperous maintenance in foreign trade." Representative Greene of Massachusetts has introduced a bill, H. R. 3216, similar to that of Senator Jones, to repeal the act of 1914, also a bill, H. R. 3218, to prohibit the payment of gratuities to the masters of vessels or other persons for the purpose of inducing or securing contracts for repairing vessels or furnishing vessels with supplies. Representative Edmonds has introduced a bill, H. R. 3226, to amend the prohibition act as applying to liquor on vessels on the high seas. Representative Butler has introduced a bill, H. R. 2692, authorizing the enrollment of officers and men of the merchant marine in the naval auxiliary reserve. Representative Edmonds has also introduced a bill, H. R. 5080, relating to bill of lading and similar requirements pertaining to the carriage of goods by sea, which would give effect to a revision of the Hague rules. A later bill proposed by Senator Jones, S. 1719, would require all foreign ships entering American ports to have a Shipping Board permit.

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Clearing the Shipping Situation

Emergency Fleet Corporation Divorced from the Shipping Board—Provisions of the Jones Bill

By "Old Scotch"

PRESIDENT COOLIDGE may be silent and non-communicative, according to the generally accepted appraisal of his personal traits, but he seems to be accomplishing important things without much fuss. Sometime during the Christmas holidays Senator Jones recommended the divorcing of the Emergency Fleet Corporation from the direct control of the Shipping Board as has been the vogue for several years. After a few conferences with men in whom the President had confidence, he suddenly came out with the directions that this important step be taken, and named a very competent man, Mr. Leigh C. Palmer, formerly an admiral in the Navy, as its head.

Improved Operation of Government Ships Expected

There can be little doubt that improved efficiency in the operation of the Government ships will very soon be apparent. As a matter of fact this procedure was the original intent of Secretary McAdoo and his advisers when the first shipping bill, creating the Shipping Board and the Emergency Fleet Corporation, was passed by Congress. The Great War came along, or, that is, our participation in it, just after the Shipping Board began to function and all pre-conceived ideas of the conduct of our merchant marine gave way to the necessities of the moment, in utilizing our merchant shipping to the best advantage for winning the war. The idea of the framers of the original legislation was that a corporation formed under the authority of the new law should be patterned as nearly as possible along the lines of the very successfully operated Panama Railroad Steamship Line. As is well known, the ships in that organization, while in reality Government property, just as much as ships of the Navy, were then and have since been operated along the lines of private ship management just as nearly as it is possible so to do. This line has always been under the direct control of a president, who selected his assistants precisely in the same manner as any other executive would do for a privately operated line. Many of the leaders in Congress have frequently expressed their entire satisfaction with the manner in which the Panama lines have been operated, and there has never been any political interference with the details of its management and operation. It is doubtful if the line has ever paid, when financially considered as a private line would be, but it has always had the reputation of being ably managed and efficient in its operation.

If the Emergency Fleet Corporation, under its new status can show as good results as its prototype has shown, there will be very little criticism justly aimed at it. There seems to be no good reason from the present outlook why it should not show improved results. Of course, we must all bear in mind that the ultimate idea is to have all the present Board ships placed under private ownership, but there is no need of fooling ourselves with the idea that this transformation is to come about rapidly. Conditions of ocean trade do not vary over night, as they depend upon worldwide economic conditions, and a conservative prognostication is that it will take at least five years from the present time before all the Government-owned ships are being operated under private management, no matter which of the pending measures in Congress to bring about this desired state of affairs may be adopted by the present Congress.

At the rate this session is proceeding, and in view of the fact that this is a presidential year, it does not now look as if any important legislation other than tax reduction and the regular appropriation measures will be passed; and the next session is the "short" one. We know too well what happened, or rather failed to happen, in the last "short" session, to have any roseate dreams on the possibilities of really important legislation from the present Congress. Hence it is well to have preparations made immediately to improve and carry on the operation of ships under Government management, and hope for the best. Admiral Palmer will undoubtedly have a splendid opportunity to show what he can do in the meantime.

Provisions of the Jones Bill

The Jones bill for remedying conditions of American shipping in the foreign trade is really two bills, and the peculiar feature of the matter is that neither of them can be considered by his own Committee on Commerce, which is the committee to which all shipping legislation is supposed to be referred and in which it should be given consideration before the Senate takes action.

The basic principle of the Senator's proposal is the long discussed one of preferential duties, which many of us believe to be the most direct and effectual way of aiding our shipping in the foreign trade. The distinction between this pending legislation and previous efforts along the same lines is that the bill, as introduced, does not propose to make the abrogation of certain commercial treaties optional with the President alone. The Constitution places the treaty making power with the President "by and with the advice and consent of the Senate, * * * provided two-thirds of the senators present concur." Therefore, one bill directing the abrogation of these commercial treaties has been proposed, and necessarily referred to the Committee on Foreign Relations. If the Senate should pass the bill as worded, and it be approved by the President, there would then be no doubt but that the fifteen months' notice would be given to each and every nation of the nullification of the treaties, as the bill states that the passage of the measure will constitute a "formal notice" to that effect.

The other portion of the Jones bill, or in this case a distinct bill in itself, is short and to the point. It can, naturally, only become effective after the abrogation of the treaties. As it relates to tariffs solely, it has under the rules of the Senate been referred to the Committee on Finance, of which Senator Jones is a member but not the chairman. As the Constitution provides that all bills for raising revenue must originate in the House of Representatives, it is quite probable that action will have to be taken there on a similar bill before the Senate can act.

Proposed Discriminating Duties

The requirements of the bill are very simple and straightforward. It provides that all goods of any kind entering the United States by water carrier from foreign countries shall be subjected to an additional ad valorem duty of 5 per centum, if not arriving in vessels of the United States. Further, that any goods now on the free list, which are brought into the United States in foreign vessels, shall after the passage of the bill be subject to an ad valorem duty of 2½ per centum. To insure that goods may not be carried to a contiguous

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foreign port on the North American continent, and then brought by land into the United States, the bill provides that the same 2½ per centum additional duties shall be levied on all goods brought into the United States by land or air vehicles, which goods are not grown or manufactured in the contiguous foreign territory.

Thus, one of the greatest objections to discriminating duties, that is that most of the great bulk cargoes, such as coffee and sugar, are now on the free list, and consequently would be of no benefit to American shipping, is overcome by the addition of this small ad valorem tax on such articles of import. This small duty on such articles of general consumption as coffee and sugar would form no appreciable extra cost to the ultimate consumer, yet it will be sufficient to overcome the differences in the cost of operating American built and owned ships over their foreign competitors. If brought in American ships there would be, as now, no duty payable, but the cost of freight would be higher, up to the point where competition of foreign bottoms could be overcome, which would, of course, have to be less than 2½ percent of the value of the cargoes carried. This practically provides a protective tariff for American shipping where none now exists, and removes the inequalities under which shipping has so long had to suffer, in comparison with other American industries, all of which are either directly or indirectly benefited by the existing tariff laws.

Preferential Tonnage Taxes

There is but one other requirement of the bill and that is an increase in the tonnage tax. This bill proposes that American registered vessels shall pay 6 cents per net ton, American built but foreign owned vessels 30 cents per net ton, and other foreign vessels 50 cents per registered ton.

All of these requirements may bring forth retaliatory measures on the part of our commercial rivals, but this idea of retaliation has arisen to haunt every measure proposed to benefit American shipping. It has been raised every time a tariff bill has been passed, but we are still doing business at the old stand, and we are selling our goods abroad in ever increasing quantities. Our best policy, it seems to the writer, is first to be just to ourselves and protect our own interests. Every other nation has the same privilege and usually avails itself of it to the utmost. We have always been foolishly generous in our dealings with commercial rivals, and if we are to continue to be a prosperous nation, we must look much more closely to our own interests than we ever have done heretofore.

Reciprocal Relations in Coastwise Trade Proposed By British

We have all seen arguments emanating from British sources, regarding reciprocal relations in connection with our coastwise trade. That is because the coastwise trade of the United Kingdom is supposed to be open to the vessels of all the world, hence we should open our coastwise trade to all foreign shipping. We have, as said before, been ofttimes foolishly generous regarding our shipping interests, but the time has not yet come, and never will, when we will swap a Yankee dollar for a British tuppence, which would be about the ratio of our coastwise trades.

The world at large must know by this time that the American people have made up their minds to have a sufficient merchant marine to protect their own interests in the foreign trade. If we elect to do it by preferential duties and increased tonnage taxes, and others think we can be scared off by threats of retaliatory measures, all well and good. We can stand it just as long as they can, and perhaps longer. All our great shore industries have been built up by similar measures, and industrially we are today feeling quite well, thank you!

Success to the Jones bills!

Improving Texas Ports

THERE is much to interest shipowners and operators, as well as shippers and underwriters, in the keen rivalry now existing between Galveston and Houston. The latter port, having perfected its canal facilities, has followed this up with the inauguration of the most modern port equipment, particularly as regards fire protection; and Galveston has taken up the challenge and is meeting Houston's bid for Gulf trade and even endeavoring to better it and secure the advantage of lower insurance rates. The port with the lowest terminal charges is bound to get the bulk of the tonnage, both inbound and outbound, and hence the feverish struggle to improve the fire protection and win the edge on that factor in the charge. Sprinkler systems are being installed on the more prominent piers, as well as by private concerns. The result is already being seen in a reduction in losses from fire in these two ports. For many years Galveston has had a practical monopoly of the import and immense export business via tidewater, but the Houston ship canal has brought about a change, and the enterprise of Houston traders is directing a steadily increasing bulk of shipping to that point.

In this connection it may be noted that the immediate and energetic protest of the Maritime Committee of the Galveston Cotton Exchange and Board of Trade against the decision of New York cotton underwriters to regard Galveston, Houston and Galveston, in the order named, as constituting two Gulf calls, for purposes of charges for deviation, has resulted in a reconsideration of the question and a decision to consider such loadings as having been made at one Gulf port. The Galveston men wanted, and secured, from the underwriters the attitude that shifts between Houston and Galveston be regarded merely as going from one loading berth to another within the same port.

The grounds upon which Galveston based its objection to the first decision were as follows: Steamers loading at Houston and Galveston have heretofore loaded first at Houston on account of the limited draft of water there and completed loading at Galveston. Recently, however, at the request of shippers who for some reason desired their cotton loaded as promptly as possible, one or two steamers have stopped at Galveston to load what cotton was already on the dock, then proceeded to Houston to load what cotton was there, and completed loading at Galveston. They insisted that there is no advantage to the steamer in doing this, but rather a disadvantage because of the extra expense incurred. The advantage, they said, is all in favor of the shippers and the underwriters, because the cotton would be loaded on board the steamer and the dock risk thereby eliminated. "In all probability," said the Galveston Committee, "if this deviation penalty is enforced, the steamers cannot afford to stand the additional penalty and it will result in them going to Houston first and leaving cotton on the dock at Galveston until the steamer comes to Galveston to complete."

Savannah Activities

A STEADY increase in shipping to Savannah harbor has been noticeable for some time past. A large part of this coastwise business is covered under insured bill of lading of the Ocean Steamship Company, and in turn is covered by the marine underwriters under bill of lading policies. The rate for this class of business is regarded as extremely low although, apparently, it works out a profit to the underwriters. The Savannah Board of Trade has issued a chart covering 1918 to 1922, inclusive. This shows that last year 949 ships of 2,530,607 tons went out of the port. It is expected that in 1923 the number will be greatly increased as returns for the last eight months are considerably larger than those of the same period for last year.

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With a Free Library On Board Ship the Hours Off Watch Can Be Profitably Spent

Maintaining a Merchant Marine Library Service

By Carl W. Shattuck*

IN order that the almost innumerable opportunities for education, entertainment and social intercourse available to the average American citizen may not be entirely lost to our seafaring countrymen, the American Merchant Marine may not partake of the fullness of American opportunity.

Recognition must be given to this problem, if the creation of a body of American men dedicated by instinct and training to the service of ships is ever to be realized. Some compensation must be made to them that will in a slight measure repay them for the comforts of life which they forego in becoming seamen. Full compensation of course is practically impossible under existing conditions, but every constructive attempt to lighten the burden of their lives is worthy.

It was with this thought in mind that the American Merchant Marine Library Association was originated.

This library service is not a charitable gesture on the part of a few well meaning women, but is an organization of national scope with President Coolidge as honorary president, and Secretary Hoover as honorary vice-president. Mrs. Henry Howard, the originator of this organization, is active president with Winthrop L. Marvin and Captain John F. Milliken as vice-presidents. On the board of trustees are many prominent shipping men and several librarians of national reputation.

Engineering and Technical Books Are Provided for Educational Purposes

Each Library, Packed in a Wooden Case, Consists of 80 Books

Library Association maintains a free library service for seamen which serves as an adjunct to the libraries and schools ashore.

The existing low morale of the personnel aboard American ships, the large number of foreigners and the lack of American boys on our ships are due in part to the fact that the remuneration is not in keeping with the type of men the service demands. To a large extent at present this is the result of the hard times through which shipping is passing. However, a more fundamental and ever-present reason for the lack of an all-American personnel is the fact that the men who go to sea

The American Merchant Marine Library Association is an outgrowth of the war service of the American Library

*Director of American Merchant Marine Library Association, New York.

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Association which supplied books to the merchant marine as well as to the army and navy. When the American Library Association discontinued its war service, Mrs. Henry Howard of Cleveland, with the firm belief that American seamen should not be forced to forego their chance of intellectual development, took steps to organize a new association to carry on the work. In November, 1921, the American Merchant Marine Library Association was organized and opened its first dispatch office in Boston in December of that year.

The growth of the organization has been rapid and the association now maintains dispatch offices with paid dispatch agents in the following ports: Boston, New York, Philadelphia, San Francisco, Baltimore, Sault Ste. Marie. The 100,000 usable books turned over to the association by the American Library Association have been increased by numerous book drives and purchases of new books so that the organization now owns over 200,000 and is in a position to realize its slogan "a library on every American ship." The association stands ready through the cooperation of shipping companies to furnish library service to all ships which call at ports other than those where a dispatch office is maintained.

One hundred twenty-eight thousand five hundred and sixty-six books in the form of 3,038 "libraries" were placed on board American ships during 1923.

A Typical Library

The average "library" as placed on board deep water vessels is packed in a standard wooden case and usually consists of 80 books, two-thirds of which are fiction—entertaining and worth while to provide a refuge from bad weather, uncongenial shipmates, boredom, gambling and sad memories—with the remainder of the case being history, biography, travel, drama, poetry, science and technical books for the many men who wish to broaden their education.

The association has acquired a very large stock of educational and technical books and is now in a position to urge men of the merchant marine to make special requests for books which they particularly desire for educational development. The association intends to fill the place of the free libraries, night schools and university extension courses which are taken as a matter of course by men ashore. The seamen are already realizing that requests for special books will receive every possible attention, with the result that an ever increasing number of these requests are pouring in.

The association makes every reasonable effort to supply special books to men who are attached to ships and will also supply books to men not on ships provided they hold an American Merchant Marine Library Association seafarers' membership. Through the efforts of Bert L. Todd, secretary of the Ocean Association of Marine Engineers and also a trustee of the American Merchant Marine Library Association, several of the large manufacturers of marine equipment have been convinced of the educational possibilities of the service and are beginning to cooperate with the association in a very material way. Marine Engineering and Shipping Age plans to bind back numbers of the periodicals and furnish these volumes for distribution with the American Merchant Marine Library Association libraries. The Westinghouse Electric and Manufacturing Company, the General Electric Company and the Power Specialty Corporation have agreed to furnish quantities of their instruction books and text books covering their equipment.

The association has been supported by contributions from shipping companies, private persons and three comparatively large sums given by the Carnegie Foundation, the United States Shipping Board and the Lake Carriers' Association.

The libraries are absolutely free to seamen. However, a Seafarers' Membership of $1.00 has been provided for men who wish to show their appreciation of the service rendered.

During the last year the possibilities of the service have been demonstrated beyond doubt. The association now needs the united support of all classes connected with shipping.

Shipbuilding in Germany

Despite the total decrease in tonnage under construction, nine new passenger and freight vessels have been added to the German merchant marine during the year. The growth from no merchant fleet at the end of the war to the present position held by Germany in the world's carrying trade indicates that competition with this country will have to be considered seriously.

ALTHOUGH figures published by Lloyd's indicate that tonnage under construction in German yards decreased from 416,081 gross tons at the end of 1922 to 301,199 tons on June 30 of this year, the *Frankfurter Zeitung* points out that much has been accomplished since the beginning of the year, says Consul O. N. Neilson in a report to the Department of Commerce.

The *Thuringia* of 11,600 gross tons was added to the fleet of the Hamburg American Line in January and the *Westphalia*, of the same tonnage, was delivered in June. These sister ships are designed for cabin and third class passengers and freight service. The *Albert Ballin*, built this year and operated by the Hamburg American Line in connection with the Harriman Company, carries three classes of passengers. The *Deutschland* is expected to be commissioned this month, and the *Cleveland*, 17,000 gross tons, carrying cabin and third class passengers, made her first voyage in October.

German Ships Added to South American Service

The *Idarwald* and the 7,500 ton *Kellerwald* were recently added to the Kosmos company's South American service. The service to eastern Asia has been improved by the addition of the *Oldenburg*, 8,650 gross tons. The Deutsche Levant Linie, which since 1919 has been dominated by the Hamburg American, plans to increase its Mediterranean service by new vessels ranging from 1,500 to 4,500 tons. The Hugo Stinnes Line, which, in cooperation with the Artus Line of Danzig, maintains a South American service, recently added to its fleet the *Albert Fegler*, the last of four vessels of 12,000 tons each.

The Deutsch-Australische D. G., which last autumn reestablished service to Australian ports, has since augmented its fleet by several new vessels. The Oldenburg-Portugiesische D. G. placed three new vessels in service during the spring and summer of 1923 and a fourth vessel is under construction. The Hansa Company has built three new 5,600-ton vessels for its Indian service.

In the cooperative service to eastern Asia the Hamburg American Line and the North German Lloyd, together with the British Holt and Ellerman Lines, have already in service, or will soon have, in addition to the *Weser*, the new vessel *Ludwigshafen* of 6,000 tons, and the sister ships *Saarbruecken* and *Coblenz* of 9,500 tons each. For the Australian service there are the 6,000-ton vessels *Aachen* and *Elberfeld*, while the *Werra*, of 9,475 tons, is sailing under the Lloyd flag for Cuba. The *Erfurt* has already started on her maiden voyage to Rio de Janeiro and the *Sierra Ventana* in the La Plata service, via New York. Two other vessels of the *Sierra* type will follow in the beginning of 1924.

The North German Lloyd is developing its American service on a large scale by the addition of three 14,000-ton oil-burning vessels, each carrying first, second, and third class passengers. The *Munich* and *Suttgart* have been launched. The *Columbus* is expected to make its first voyage in the spring.

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British Shipowners Analyze Performance of Motorships

Results Compared with Performance of Steamships—Excess Tonnage Retards Shipbuilding—Shipping Combines Start Controversy—Restriction of Coastwise Trade

By W. H. Wendon

A SUBJECT which comes in for an ever-increasing share of attention in shipowning, shipbuilding and marine engineering circles is in regard to the working results of Diesel-engined craft as compared with boats driven by other methods of propulsion. Opinion now is almost unanimous that the Diesel vessel is the boat of the future, but acknowledged experts, while endorsing this view, in some instances make notable reservations. And in this regard, the views of Sir Eustace d'Eyncourt, who relinquished as from the end of 1923 the post of Director of Naval Construction and Chief Technical Adviser to the Admiralty, in order to rejoin the firm of Sir W. G. Armstrong, Whitworth & Company, Ltd., have been much in the public eye.

Diesel Engines Unsuitable for Large, Fast Liners

Sir Eustace holds the belief that the Diesel engine promises the greatest economy that can be looked for with any form of engine for marine propulsion, but, on the other hand, he considers that the engine is unsuitable for liners of the type of the *Majestic*, or even the smaller *Mauretania*. "In regard to the economy of fuel," says Sir Eustace, "the oil used in the best Diesel engine will probably take a ship about twice the distance, for the same cost, as coal. We have installed a Diesel engine in a cruising unit, and it is giving us about twice the distance it did before for the same outlay. Improvements are gradually being introduced into the Diesel, and it now comes to this, that ships wanting very high power on moderate weight can employ it to advantage, even after making allowance for the heavy initial cost."

Mr. J. Herbert Scrutton, chairman of Lloyd's Register of Shipping, holds great faith in the marine engineer, and believes he will work out the useful development of the Diesel engine until its use becomes universal.

Comparative Results of Steam and Motor Vessels

Reverting to the comparative results of Diesel- and other engined-vessels, the following form the latest illustrations:

TABLE 1

	C. Coal and steam; forced draft.	*E.* Oil and steam; forced draft.	*G* Doxford "A" opposed piston oil engine and elec. aux.
Net tonnage	2,730	2,720	2,715
Deadweight	7,970	7,960	7,980
Outward cargo, tons	6,185	7,190	7,505
Homeward cargo, tons	7,135	7,210	7,694
Expenses, including depreciation, insurance, management, repairs and general voyage expenses	£11,725	£13,405	£11,287
Freight:			
Outwards	£4,376	£5,087	£5,310
Homewards	£8,918	£9,012	£9,617
	£13,294	£14,099	£14,927
Profit for 105 days	£1,561	£694	£3,640
Profit for 365 days	£5,454	£2,412	£12,653
First cost of vessel	£80,380	£83,290	£114,580
Profit per annum on capital outlay	6.785%	2.895%	11.043%

Examples C. E. and G. relate to a round trip from Cardiff to Buenos Ayres, with coal at 15s. per ton (less 2 percent in lieu of weighing, 2 percent address, and one-third of 5 percent brokerage). Table 2 shows how the difference between the two types is affected by taking the freight earnings as a basis of comparison.

Mystery Surrounds Latest German Diesel Development

Apropos Sir Eustace d'Eyncourt's view that the Diesel engine is unsuitable for the larger liners, one notes with interest the secrecy prevailing in Germany with regard to an improvement of the Diesel motor carried out by two well-known shipbuilding people. The important part of the matter is that it is believed that the so-called improvement is nothing less than a solution of the problem as to how Diesel motors may be employed for large passenger vessels. Trials have been carried out in the presence of technical experts and representatives of the leading German shipping companies, but the only details that have thus far been permitted to transpire are that the "test" vessel which has been fitted with the new engine is in course of construction in a German shipyard. She is scheduled to be placed in commission early in 1924, when, of course, more will be known regarding this rather intriguing question.

TABLE 2.—DOXFORD 10-KNOT MOTOR VESSEL. OPERATING COSTS S.S. CARGO VESSEL TYPE OPEN SHELTER DECK.

Dimensions 375′ 0″ bp. × 52′ 6″ ex. × 28′ 3″ mld. Loaded draft 25′ 0″.

Type of machinery	Coal steam N.D.	Oil steam N.D.	Doxford opposed piston oil engine steam auxiliaries.
Cost of vessel	£80,890	£84,000	£106,600
Deadweight (cargo and bunkers)	7,925	7,920	8,000
Cargo d.w. Cardiff to Buenos Ayres	6,045	7,095	7,400
Cargo d.w. Buenos Ayres to Cardiff	7,045	7,115	7,670
Cost per ton of d.w. (cargo and bunkers)	£10 4 2	£10 12 1	£13 6 6
Cost per ton of cargo d.w. Cardiff to Buenos Ayres	£11 7 7	£11 16 9	£14 9 9
Cost cargo d.w. Buenos Ayres to Cardiff	£11 9 8	£11 16 1	£13 7 11
Average price per ton freight Cardiff–Buenos Ayres and Buenos Ayres/Cardiff	£12 8 7	£11 16 5	£13 18 10

World's Tonnage in Excess of Requirements

A famous shipowner, in reviewing the shipping position, mentions that, while it is difficult to say anything good about shipowning during the past twelve months, so far as shipbuilding is concerned no serious harm has been done. In his opinion, the ships which have been built have been largely of the liner type for special services, and figures which he quotes show that the increase of tonnage is very moderate, since, while about two million tons of new tonnage have been launched, some 1,200,000 tons have been condemned or broken up, so that the net addition is under 800,000 tons. (Parenthetically, I may say that I give this computation with all reserve, inasmuch as opinions differ to a very great extent as to the approximate amount of the so-called surplus tonnage in existence at the present time as compared with

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the last pre-war year.) However, in the view of the authority whom I am quoting, this fact contains a measure of hope. There is, he thinks, no doubt that the tonnage of the world is at present considerably in excess of the requirements, "but, the longer the revival is deferred, the less is the chance of the American tonnage at present laid up coming into the fray. If, therefore, we deduct the non-efficient American tonnage and the new oil-tank tonnage from the world's total, we shall not be very far above the pre-war total."

Incidentally, this authority touches on the Steamship versus Diesel discussion. He regards the future as "necessarily uncertain," adding: "The steamship is threatened by the Diesel. We may hope, however, that the change will be gradual—any attempt to force the pace would be detrimental." Apropos certain remarks by Mr. Stanley Baldwin, it is the contention of this leading British shipowner that—while it is most regrettable that there should be so much unemployment in the shipyards—for governments to relieve such unemployment by subsidizing the increased production of ships, whether Diesel or steam, would be a remedy likely to prove worse than the disease. He holds that one element is in the fact that governments which were tempted to embark in shipowning have had their experience, have not found it satisfactory and are not likely to find imitators—"in fact, their disposition is to get out of it if and when possible."

Controversy Over Shipping Combines

The question of shipping combines is receiving rather ample discussion at the present time, it being maintained in one quarter that they are likely to become stumbling-blocks to initiative in that they tend to departmentalism on the lines of government offices. Lord Inchcape, head of the P. and O. group of companies, however, in taking up the cudgels on behalf of the "combines," declares that none of his associates, colleagues or staff, either at home or abroad, would endorse the idea that his disposition is to curb initiative or to turn down well-considered proposals. He expresses the fear that it is more frequently the other way round, and that his suggestions are very often sat upon. That there is another side to the picture, however, is evident from the remarks of Mr. William Henderson, joint manager of the Anchor Line, whose view on this interesting topic is as follows:

> An increasingly prominent factor in modern ship-owning is to be found in the segregation of immense interests under one management. This development is apparent both in the foreign and coasting trades, and it calls for the most careful consideration. The advantages of centralized control in increased efficiency and economy of administration are great and apparent; the interchangeability and adaptability of vessels on routes operated by the combine give a variability of employment and elasticity of profit-earning not procurable under other conditions. It is at times suggested, however, that there are some counter-balancing disadvantages. It appears to follow as an invariable result in the development of those large combinations, with their varied and multiple operations, that the sense of individual responsibility is lessened and the element of personality is obscured in general throughout the whole organization. The leakages both in personnel and material which take place are also such as are more preventible in well-managed concerns of normal dimensions.

The view of an independent authority is that, apart from the ills which trusts bring with them, anything which leads to the same results as either the nationalizing of industry or state trading is bound to bring the evils of officialdom in its train.

Restriction of Coastwise Trade in Foreign Countries

Lord Kylsant, the head of the Royal Mail Steam Packet group, has spoken in trenchant terms on the subject of the restriction of the coastwise trade. Foreign nations, he says, are not content with raising tariff walls against British goods. Within the last two years one of his shipping companies has had to face the fact that a foreign country, in addition to taxing exports, went further, and, "following the bad example of America," prohibited British steamers trading between ports on their coast. In 1840 the Pacific Steam Navigation Company (a Royal Mail subsidiary) commenced a service on the coast of Chile; it gradually built up the service, and carried it on for the better part of a century, but in August, 1922, a law came into force reserving the Chilean coastwise trade to steamers under the Chilean flag, thus prohibiting British steamers continuing trade on the Chilean coast. Supposing, says Lord Kylsant, the Chilean Government had known that the British Government possessed an instrument of retaliation, he cannot help think that the friendly representations which were made to Chile would not have been so futile as they proved to be. The Royal Mail chairman incidentally mentions that his company had six old vessels employed in the Chilean coasting trade, which, but for the new law, they were about to replace by the most modern type of motor-vessel.

United States Strong Competitor in Coal Export Trade

Real concern is being displayed in North of England shipping quarters in connection with the coal export trade of the United States. A sub-committee of the North of England Steamship Owners' Association has been going into the "possible improvements of the loading facilities of the River Tyne," and, *inter alia*, mentions that the provision of additional facilities, and all-round reorganization and improvement of the existing facilities, with the object of giving good despatch to all steamers loading cargoes or bunkers, will enable coal to find a readier market, and thus meet foreign competition, "which has every indication of becoming more severe." Attention is drawn by the committee to the efforts which are being made by the United States with the object of extending its coal export trade. In addition to such places as Curtis Bay, three additional staiths are said to be under erection at Seawall Point, one of which, with six berths, will have a dumping capacity of 70,000 tons per 20 hours. The feeling is that the United States appears determined to overcome the disadvantage of distance of its coal mines from the seaboard, and of its shipping places from European markets. "By using 100 and 120-ton trucks," the committee states, "it shortly expects to bring its coal to the seaboard at a price of $3.50, say sixteen shillings, per ton f.o.b. By loading vessels with extraordinary despatch, it is securing freightage to the Continent at $2.20, say ten shillings, per ton. It would thus be able to land coals on the Continent at about 26s. per ton c.i.f."

As I have indicated, the foregoing is arousing considerable alarm, for, as the committee points out, it is evident that the Tyne district must improve its coal-shipping facilities all-round if it is successfully to face that competition. The emphatic view of the committee is that one of the best means of accomplishing this is by increasing and improving the facilities of shipping coal, so that vessels are loaded in the shortest time possible. "In this way," it is urged, "coals will be carried at the lowest possible freight."

Another "Trade Ship" Enterprise Fails

Success is not the outstanding characteristic of "trade ship" enterprises on this side of the Atlantic. The latest scheme to fail revolves round the ex-Orient liner *Orontes*, a contract for the purchase of which, for £45,000, was entered into by a syndicate, it subsequently being found that £30,000 was required thoroughly to overhaul her machinery. "British World Trade Expeditions, Ltd.," was the title of the enterprise, the nominal capital when the company was incorporated in March, 1922, being £25,000, this sum being increased on a subsequent occasion to £75,000. Insufficiency of capital is the principal reason attributed for the company's failure, although, in the official receiver's opinion, "mismanagement was a contributing cause." The liabilities amount to £103,-

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000, while the assets are estimated at only £5,000, a total deficiency of £28,635 being disclosed with regard to the shareholders. It has been decided to leave the compulsory liquidation of the company in the hands of the official receiver, it being stated that only from an advantageous sale of the *Orontes* can the creditors anticipate any dividend.

THE BRITISH ATTITUDE ON DISCRIMINATION

The shipowners of the United Kingdom are quite prepared to admit that the hopes which they held out in regard to the trend of events at the Imperial Economic Conference in London in October have—at all events up to the time of mailing—been fully justified. There is, in fact, no occasion for disguising that the resolutions unanimously passed at the conference hold, for shipowners, interest of far-reaching importance. Firstly, in regard to flag discrimination, a subject which has vexed the minds of shipowners for many months past, the conference delegates have unanimously agreed to a resolution in the following terms:

"In view of the vital importance to the British Empire of safeguarding its overseas carrying trade against all forms of discrimination by foreign countries, whether open or disguised, the representatives of the Governments of the Empire declare:—

"(1) That it is their established practice to make no discrimination between the flags of shipping using their ports, and that they have no intention of departing from this practice as regards countries which treat ocean-going shipping under the British flag on a footing of equality with their own national shipping.

"(2) That in the event of danger arising in future to the overseas shipping of the Empire through an attempt by a foreign country to discriminate against the British flag, the Governments of the Empire will consult together as to the best means of meeting the situation."

Such a policy as laid down in this resolution is obviously of vital interest to Empire communications, so that it is scarcely surprising to learn that the motion was agreed to by the Empire representatives after only the briefest of discussions.

TAXATION OF SHIPPING PROPERTY

The taxation of shipping property is another important subject which has claimed very prominent attention since my review appeared in the November issue of MARINE ENGINEERING AND SHIPPING AGE. To realize the significance of the latest development it is necessary to go back to the holding of the International Shipping Conference in London, in November, 1921. That conference may be within the recollection of all shipping men, and not least, perhaps, will it be recalled that a committee was specially constituted to go thoroughly into the question of taxation. That committee has now given expression to its views in the form of resolutions in which it is maintained that, for the general benefit of international trade, it is desirable to define clearly to which country each shipowner or shipowning company should pay taxes on shipping, and that the various countries should, by reciprocal agreements, disclaim the intention to tax "foreign" shipping. Further, the committee has resolved that the country in which the shipowner or the actual management of a shipowning company resides is the country to which that individual or corporation should pay taxes on shipping, and that no other country should tax such individual or corporation in that respect. And, finally, the committee is in complete agreement that it is desirable that all maritime nations who have not already done so should at once approach the Governments of Great Britain and the United States with a view to accepting the offers contained in the finance acts of Great Britain and the United States in reference to taxation of shipping, and, further, that they should approach other maritime countries with a view to establishing similar relations with such other countries.

Two other important points arise in connection with this question of taxation; one is the contention of the committee that the principles of immunity from taxation abroad should apply to all taxes on shipping, whether federal, state, municipal or otherwise, and the other is that the holding of an international convention on the subject is, from many points of view, desirable.

WIRELESS CONFERENCE DESIRABLE

Wireless telegraphy is another subject which has received the attention of shipowners, also arising out of the 1921 International Shipping Conference. The committee specially constituted to deal with this branch of affairs has resolved that it is desirable that the maritime states should take steps to convene an international conference for the consideration of wireless problems, and, pending the proposed conference, all maritime states are urged by the committee not to apply to foreign vessels regulations more onerous than those in the convention of 1914. In the meantime, the governments of the maritime states should, in the opinion of the committee, be invited to give the closest study to the problem of perfecting an automatic device and alarm signal within the next six months. It may be mentioned, as signifying the weight behind the delegates' views, that there were present at a meeting at which the foregoing resolution was passed representatives of Australia, Belgium, Canada, Denmark, France, Germany, Great Britain, Holland, Japan, Norway, Spain and Sweden.

Some remarkably interesting figures have been compiled showing the earnings over a period of years of four of the leading British liner companies. The first of the companies has distributed £3,176,503 in dividends in the past fourteen years, representing 7.14 percent on the total capital of £44,453,292; the second has paid £6,749,500, or 21.77 percent on £31,000,000; the third £6,773,186, or 10.19 percent on a capital of £66,454,253; and the fourth £3,184,000, or 5.74 percent on £55,400,000. A further calculation reveals that the total capital of the four companies in the fourteen years under review amounts to £197,307,545, on which dividends aggregating £19,883,189 have been distributed, equal to slightly over 10 percent.

An interesting point arising out of these figures is that the company which shows the most satisfactory results from the point of view of dividends distributed is the one which has made the smallest addition to its fleet, while the company which shows the largest fleet increase—its size has, in fact, just doubled in the fourteen years—is a very moderate third in the list of four.

WORK OF THE IMPERIAL SHIPPING COMMITTEE

The Imperial Shipping Committee—the value of whose existence, by the way, has been placed on a high level by the Imperial Economic Conference, which has declared that the work accomplished by the committee is convincing proof of the wisdom of its establishment—has given, through its chairman, Sir Halford Mackinder, some interesting views on the question of mail services. Sir Halford Mackinder states that the committee has come to the conclusion that the only way in which it can be hoped to carry passengers and mails rapidly within the next generation from certain parts of the Empire to the central parts of the world will be by a combination of air, sea and land. The committee has, therefore, proposed a system whereby there will be a saving of a week in the carriage of mails and first-class passengers between London on the one hand and Melbourne and Sydney on the other hand. "You are," to quote Sir Halford Mackinder, "to save four days by airship from this country to Egypt; two days on the Indian Ocean by speeding up a little the steamships on that ocean; and one day by saving a certain amount of time which at present is lost at Fremantle before the train starts, and perhaps a little on the trans-Continental journey." Sir Halford considers that this method of saving a week is a more prac-

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tical way than the suggestion which was originally put to the committee, namely, that a subsidy should be paid sufficient to provide a service of steamers comparable with that operating on the North Atlantic.

Shipping Controversy with Italy

Somewhat bitter views are being exchanged between England and Italy on a shipping matter arising out of the war. Briefly, the British Government, at the request of the Italian authorities of the day, handed over to Italian shipowners "standard" steamers four years ago, when, of course, rates of exchange and the general level of shipping values were by no means on the lines of present figures. In fact, no fewer than fifty-four standard cargo boats were transferred to Italy for a sum exceeding £11,000,000 sterling. It is over the "sterling" that the dispute has arisen, for, while the Italians have paid about £9,000,000 of the £11,000,000 owing, they are pleading earnestly that one-half of the remaining £2,000,000 should be disregarded on account of the great depreciation in shipping values and the exchange slump which have occurred since the deal was fixed in 1919. The British authorities do not see their way to agree to forego £1,000,000, and it is contended, perhaps not wrongly, that, if the positions had been reversed, the Italian Government would in all probability have insisted that the bargain be kept. Furthermore, it is felt that, if either of the governments is to come to the rescue of Italian shipowners, it should be that of Italy, whose predecessors in power were responsible for the error in 1919 in imagining that the acquisition of the standard fleet would result in untold riches.

New Development in Oil Separators

A machine, which, it is claimed, separates oil from water at the rate of 100 tons an hour, has received some attention in shipping circles here. At a demonstration in the presence of Admiralty and mercantile marine experts, many tons of bilge water, made up of 15 percent heavy oil and 85 percent water, were passed through the apparatus which is called the rocket oil separator. The oil fuel passed into a tank, from which it could be fed again to boilers, and the water passed, almost clean, into the river, and left no oily trace of its passing. The chairman of the syndicate that is marketing the invention claims that four of the separators fitted in a liner such as the *Berengaria* would save the first cost in six months. An enormous amount of oil fuel is annually pumped overboard, and contaminates England's coastal waters and tidal rivers. This yearly loss is very considerable in oil fuel alone, and to it must be added the damage done to bird and fish life, and the risk of fire in port.

(Photograph by Aerofilms, Ltd., London)

Southampton Docks, Showing (from Top to Bottom) the Cunard Liner Aquitania and White Star Liners Homeric and Olympic

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Twin-Screw Passenger and Freight Steamer Columbus

Built for the North German Lloyd Steamship Company by F. Schichau, Elbing and Danzig, Germany

By Dr.-Ing. E. Foerster

UPON the basis of successful experience with the *George Washington* the North German Lloyd Steamship Company designed a larger liner of the same type which was called the *Columbus* when she was launched before the war. This vessel had to be delivered to the Allies according to the peace treaty of Versailles, and was transferred to the White Star Line which is successfully running her under the name *Homeric*. A sister ship was on the stocks with completed double bottom when the war ended, while the *Columbus* was almost completed. The former was left in possession of the North German Lloyd Company who called her *Columbus* again. This vessel has now been completed and has undergone a successful trial after which in the middle of December the maiden-trip was carried out.

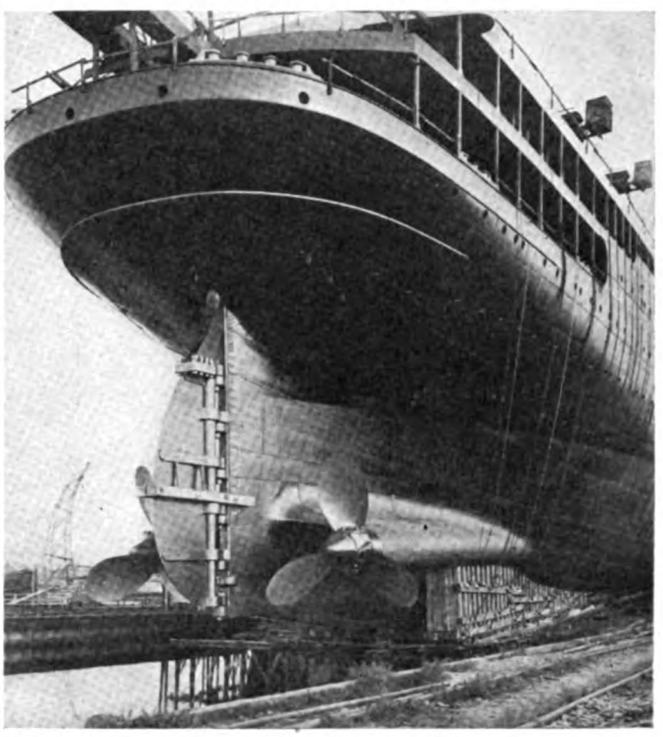

Fig. 1.—S. S. Columbus Before Launching

General Features

The vessel has been built according to the highest class of the Germanischer Lloyd $100 \frac{A^1\ A}{4\ (E)}$ with freeboard; the material being best soft Siemens-Martin steel shipbuilding quality. The equipment is in accordance with the new rules of the American and German law for emigrant vessels as well as the bulkhead rules of the German Board of Trade. The regulations of the international treaty for life saving at sea have been followed in order to obtain the highest possible degree of safety. It is of special importance to notice that the vessel's design and details of arrangement are influenced by the fact that she is running in the combination made between the United States Lines and the North German Lloyd.

The vessel has a vertical stem, a long bridge, two smokestacks; 14 watertight bulkheads forming 15 compartments, and 8 steel decks. The main dimensions are:

Length over all: 774 feet 11⅝ inches.
Length between perpendiculars: 750 feet 2½ inches.
Beam at the waterline: 83 feet.
Depth molded from top of keel to the main deck at side: 54 feet.
Draft: 31 feet 11⅞ inches.
Weight, all told: 10,000 tons.
Normal indicated power: 28,000.
Speed on trial: 20 knots.

The scantlings are shown on the midship section. The general arrangement is shown by the profile and the deck plans.

Important Details

The upper-girder is the upper promenade deckplating combined with the shell-strakes between this deck and the next one below. Special care has been devoted to the ends of the superstructure. The superstructure decks above the girder deck have been cut at two points where expansion joints are arranged, thus avoiding excessive stresses. In the design of the rudderpost and the brackets for the shafts special care has been taken to avoid vibrations. These parts have been manufactured from cast steel with the exception of the rudder plate. The most important parts have the following weights:

The stern frame upper part .... 30,940 pounds
The stern frame lower part ..... 39,780 pounds
The brackets 119,340 pounds
The rudder frame with plate .....79,560 pounds
The rudder shaft 61,880 pounds
The stem .. 26,520 pounds

Arrangement of the Space Below the Passenger and Crew Quarters

It is of importance to mention that the double bottom is not used for carrying fuel oil but only for fresh water, feed water and ballast. The peak spaces and several large tanks above the double bottom are also arranged for fresh water. The inboard profile gives a clear idea of the arrangement of oil bunkers and of the cargo holds. There are six large trunk hatches for serving the cargo spaces, one of the forward ones being of special large size for the purpose of transporting autocars for passengers. The size of the provision rooms has been calculated on the basis of 35 cubic feet for each person on board. Two-thirds of the provision rooms are equipped as refrigerated rooms.

Passenger and Crew Capacity

The passenger accommodation and the spaces for the crew extend from the fourth deck up to the boat deck. The principle on which the ship has been designed is the complete separation of the various passenger classes. The total number of passengers that can be accommodated in the private and public rooms is as follows:

513	1st class passengers
574	2nd class passengers
705	3rd class passengers
1,792	passengers
733	crew
2,525	persons all-told

It is of value to compare these figures with the following figures for the sanitary equipment:

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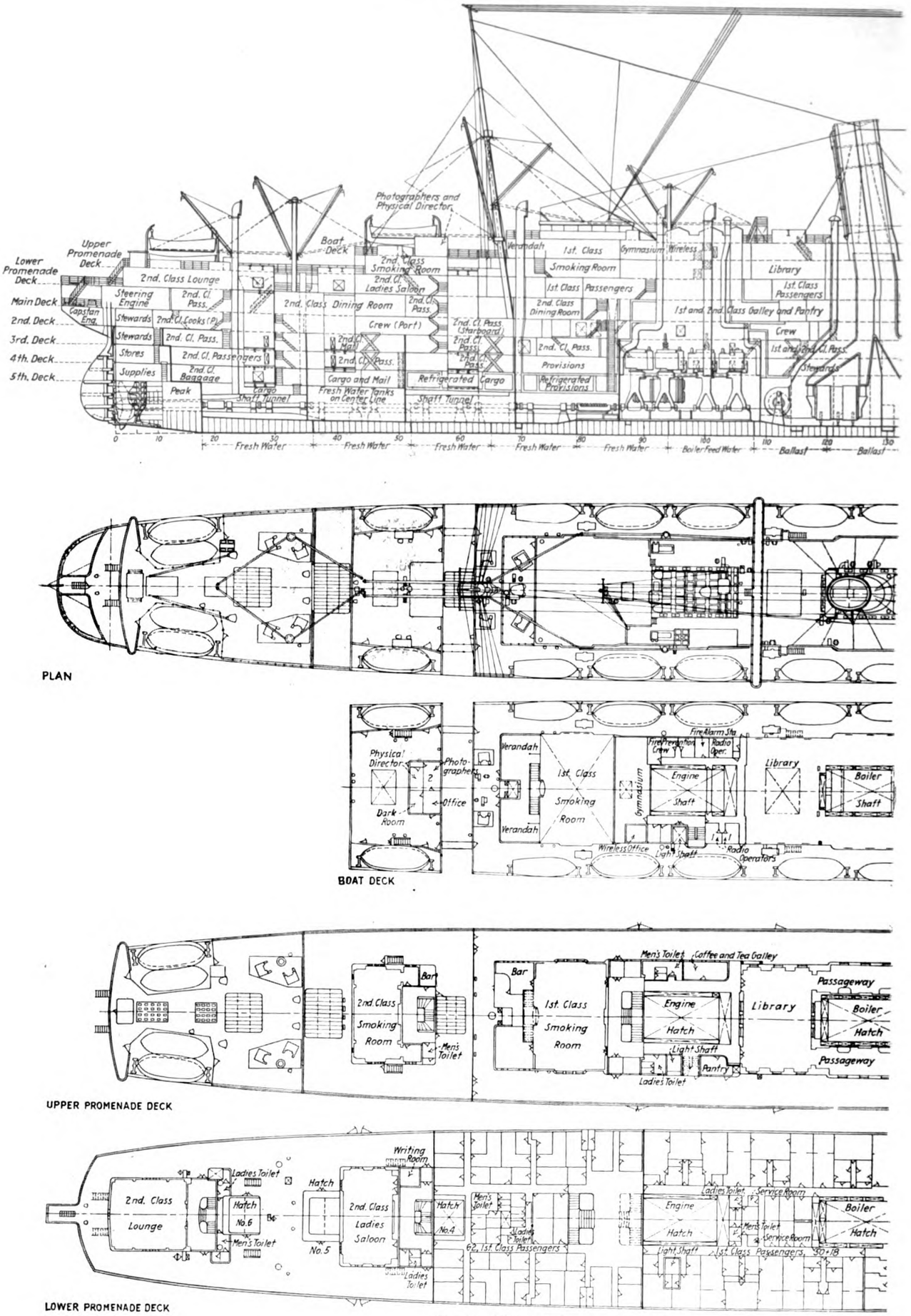

Fig 2.—General Arrangement Plans of Steamship **Columbus:**

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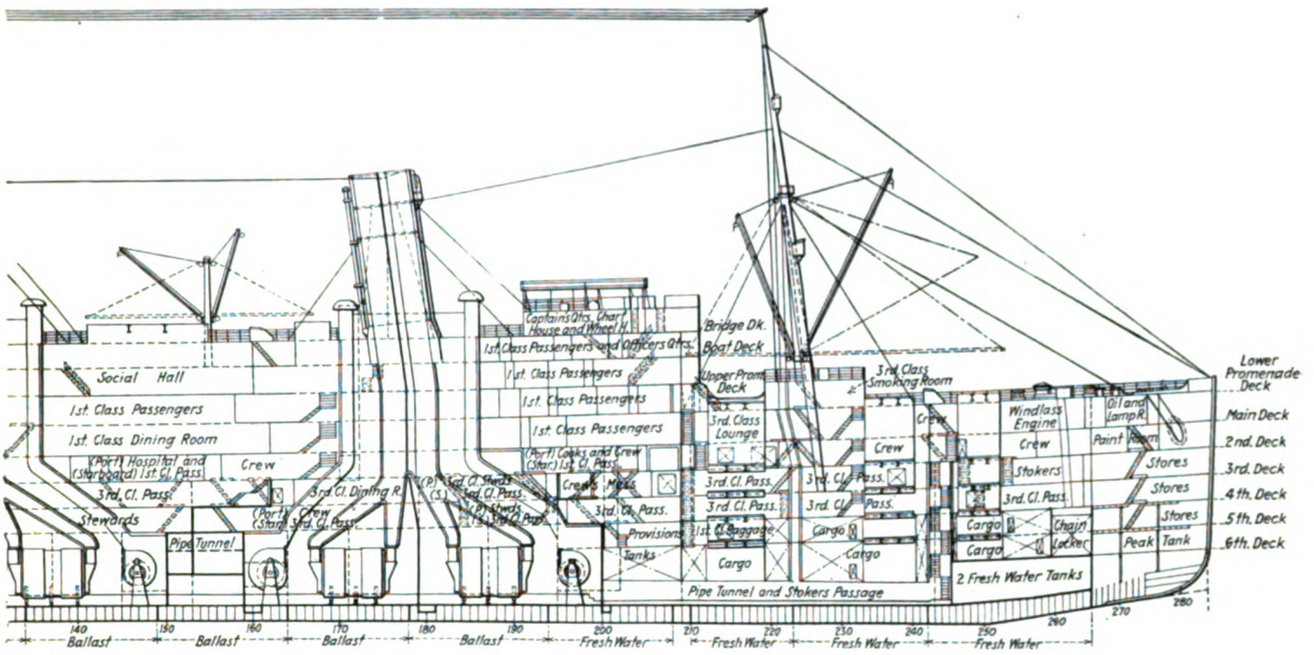
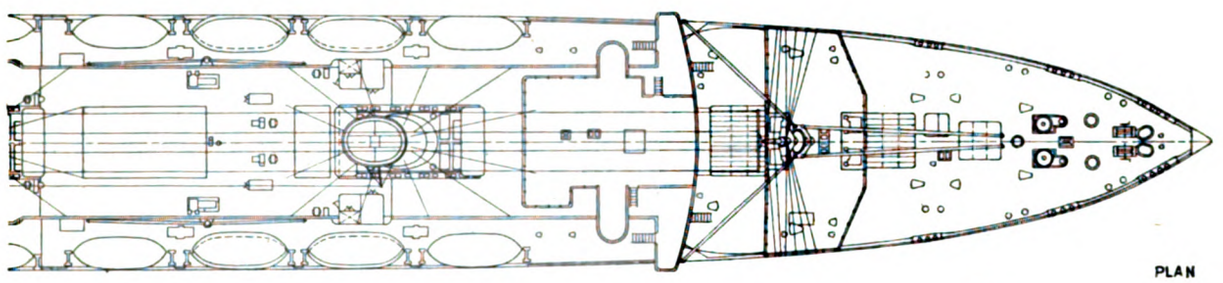
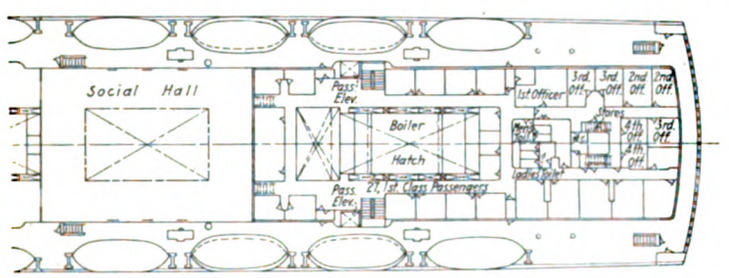
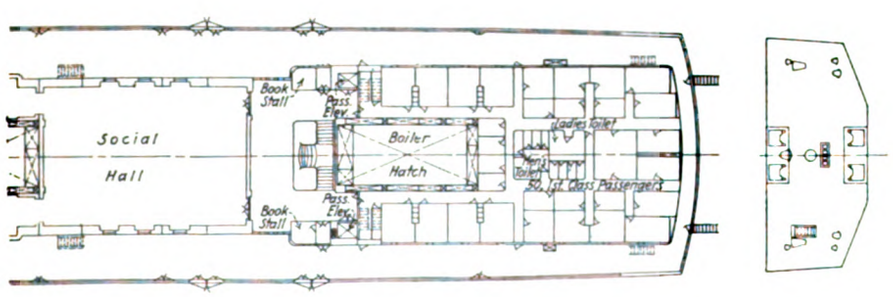




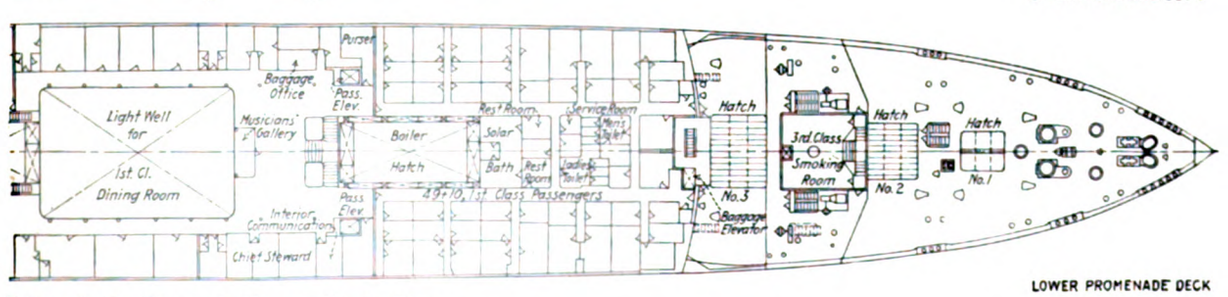
PLAN



BOAT DECK



UPPER PROMENADE DECK



LOWER PROMENADE DECK

Inboard Profile and Upper Deck Plans

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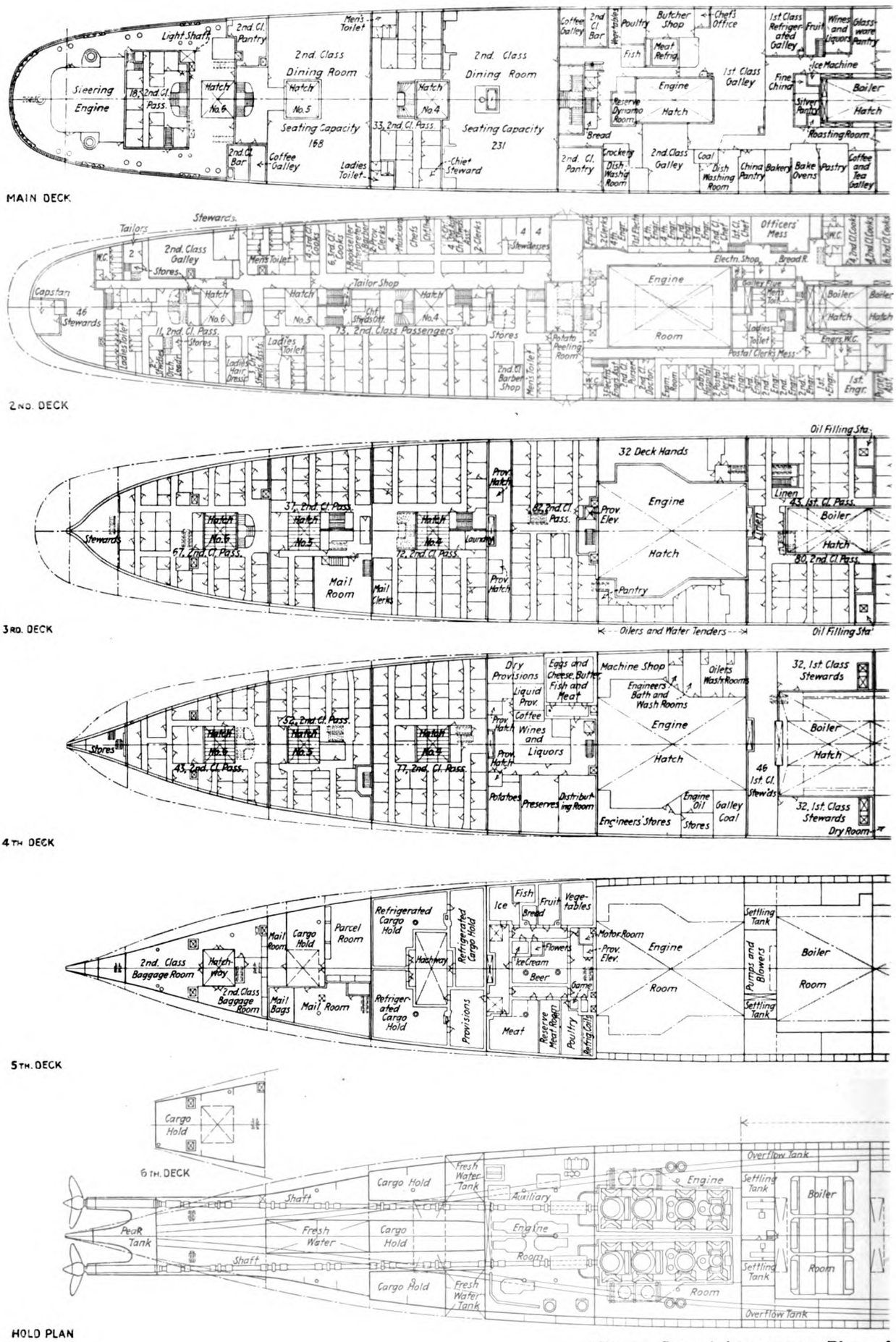

Fig. 3.—General Arrangement Plans of

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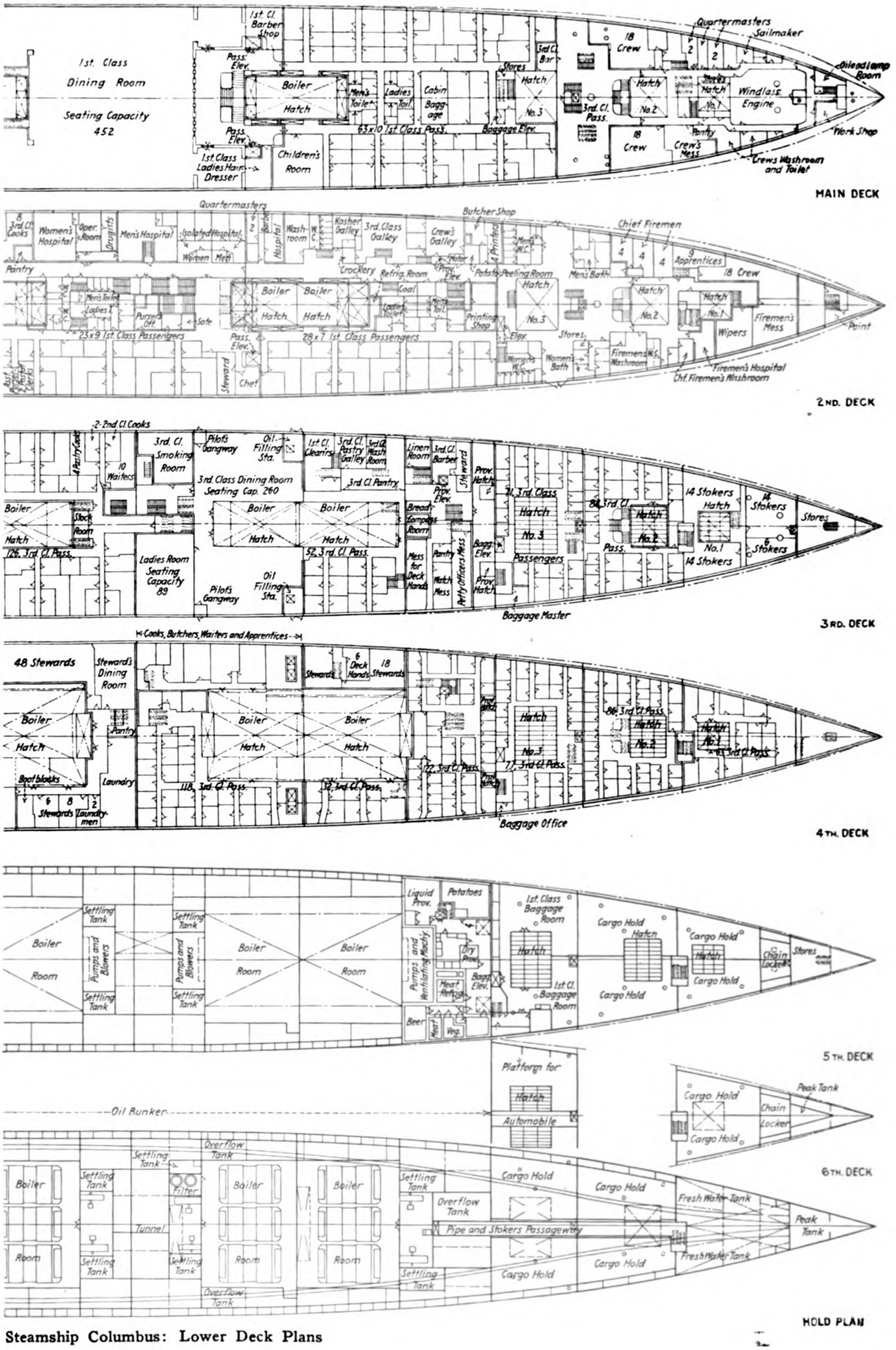

Steamship Columbus: Lower Deck Plans

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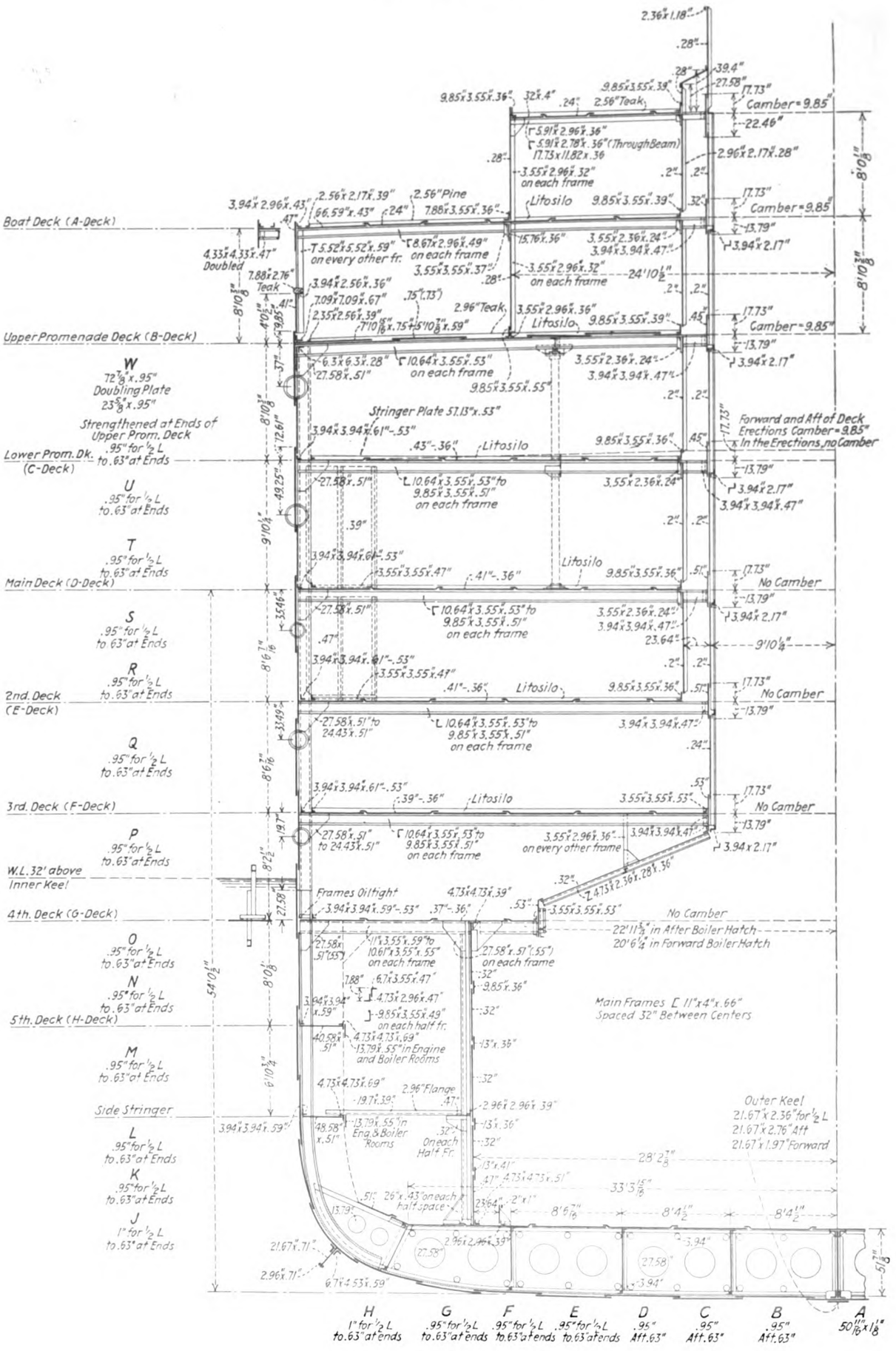

Fig. 4.—Midship Section

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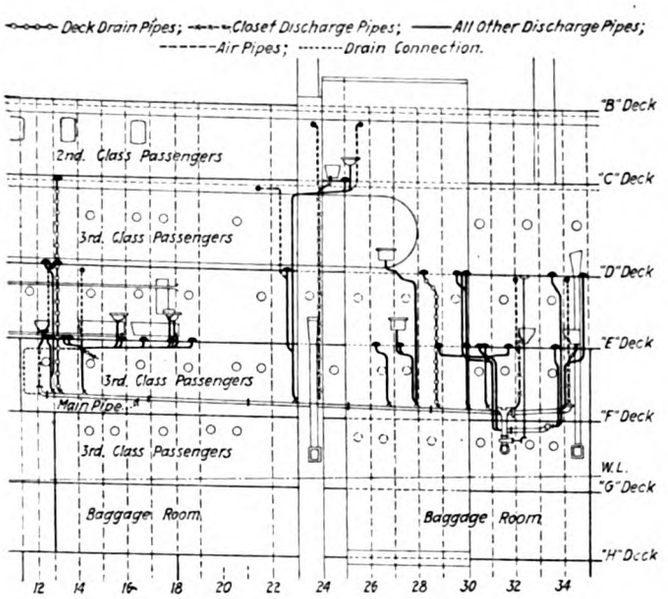

Fig. 5.—Drainage System

	Baths		Shower-Baths	
	public	private	public	private
1st cl. +	26	30	..	4
2nd cl. +	28	..	..	..
3rd cl.	11	..	1	..
Crew	8	..	15	..
	73	30	16	4

+ including officers.

	Bath basins with running water		Toilets	
	single	double	public	private
1st cl. +	227	90	53	41
2nd cl. +	34	6	58	..
3rd cl.	13	2	16	..
Crew	6	..	39	..
	280	98	166	41

+ including officers.

In connection with the sanitary equipment it should be mentioned that a new system of centralized drains has been adopted instead of the numerous single drains which doubtless are a certain danger to the ship and involve a greater length of piping than by following the system indicated by Fig. 5. The longitudinal piping is arranged on both sides of the vessel while the single drains of the baths, toilets, pantries and galleys have connections to both longitudinal pipes, thereby insuring the working of the whole even when the ship has a heavy list to one side or the other.

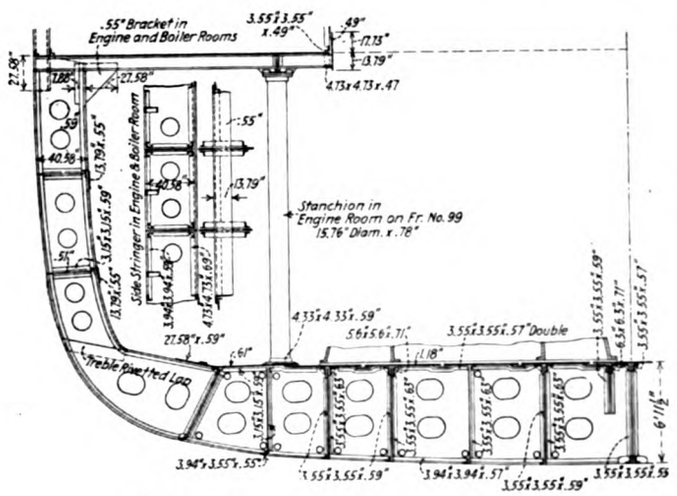
.55" Bracket in Engine and Boiler Rooms
Stanchion in Engine Room on Fr. No. 99
Side Stringer in Engine & Boiler Room
Treble Riveted Lap
Double

Fig. 6.—Section Through Engine Room

HEATING AND VENTILATION

Steam heating is adopted for all saloons, vestibules, corridors and all public rooms for passengers as well as in the passenger cabins. For the crew space and third class passengers a system of steam air heating is adopted. For this purpose there are two combined heating and ventilating systems (Fig. 8) either one of which has sufficient capacity to heat these spaces. The connections are so arranged that either heater can deliver air to both systems. The first class staterooms and the private baths of the first class are electrically heated. For the ventilation of the whole interior of the vessel as far as passenger and crew spaces are concerned there are 24 fans for supplying air with a capacity of 14,124,000 cubic feet per hour, while 25 fans with 10,946,100 cubic feet per hour are available for the exhaust. In addition to these there are two pressure fans for the engine room and two for the refrigeration rooms as well as two suction fans for the auxiliary engine room and for the oil fuel tanks. Practically all fans are electrically driven—only eight pressure fans for blowing fresh air into the boiler rooms are driven by steam.

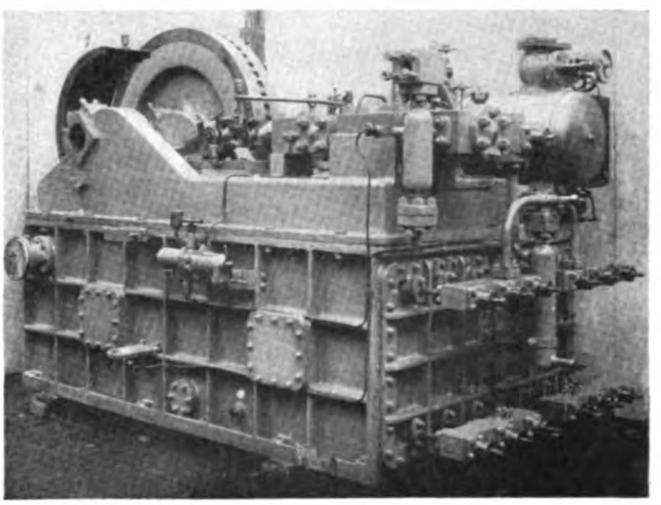

Fig. 7.—Refrigerating Engine

AUXILIARY MACHINERY OF THE SHIP

(All designed and built by the Atlas-Werke, Bremen.)

The bow-anchor and capstan plant for handling the two 9-ton bow-anchors with their 3¾-inch cables consists of two anchor capstans with vertical shafts as may be seen from Fig. 11. In connection with the two anchor capstans there are two other capstans whose warping heads are on the lower promenade deck while the gear is on main deck. The whole is driven by two compound steam engines of 19 11/16 inches diameter of cylinder and 19 13/32 inches stroke. Each of these engines can serve the opposite anchors and capstans. (Steering-engine Fig. 10.)

For maneuvering the rudder there is a main and an auxiliary engine. The main engine is a compound having cylinders 15¾ inches diameter and 11⅞ inches stroke; connected to the main quadrant. The auxiliary steering engine is also compound with cylinders 11 inches diameter and 13¾ inches stroke and working on the spare quadrant below the main quadrant.

There are several interesting types of winches which deserve mention. The electric cargo winch for provisions has a capacity of 2,652 pounds and a lift speed of 0.75 per second and is driven by a direct current electric motor of 15 horse-

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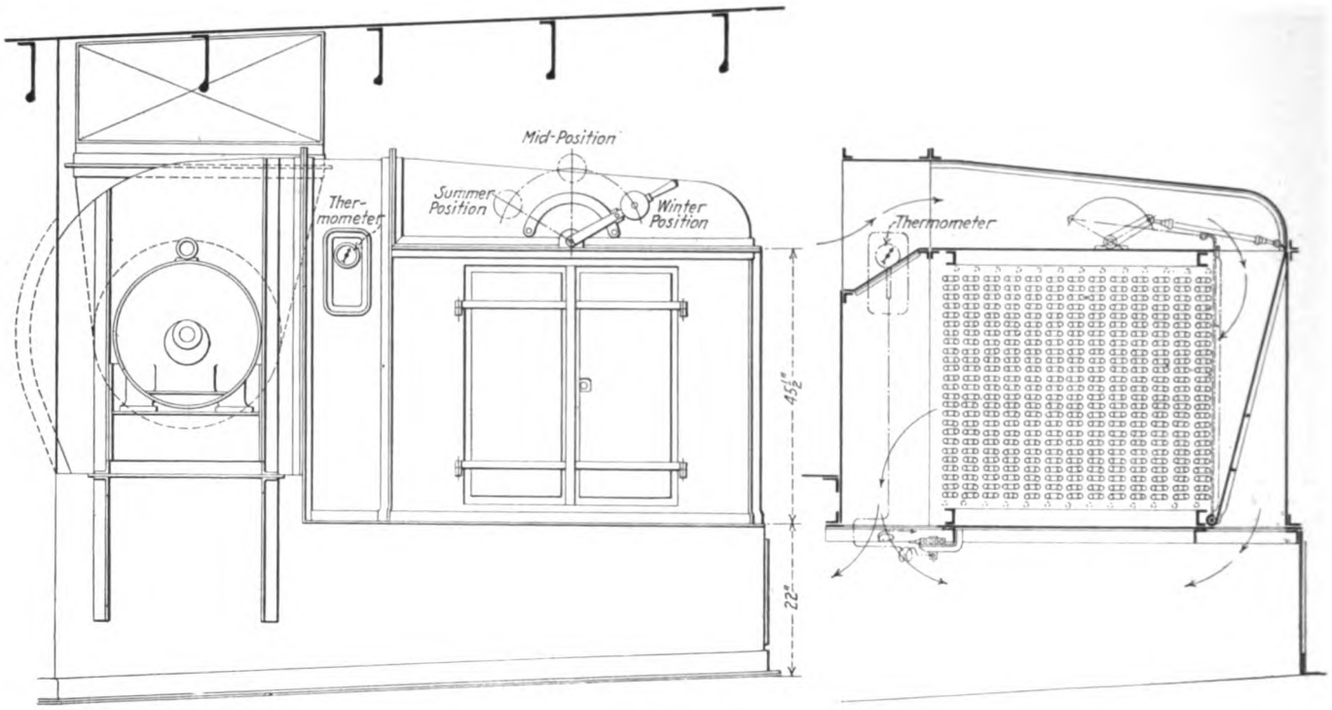

Fig. 8.—Combined Heating and Ventilating System

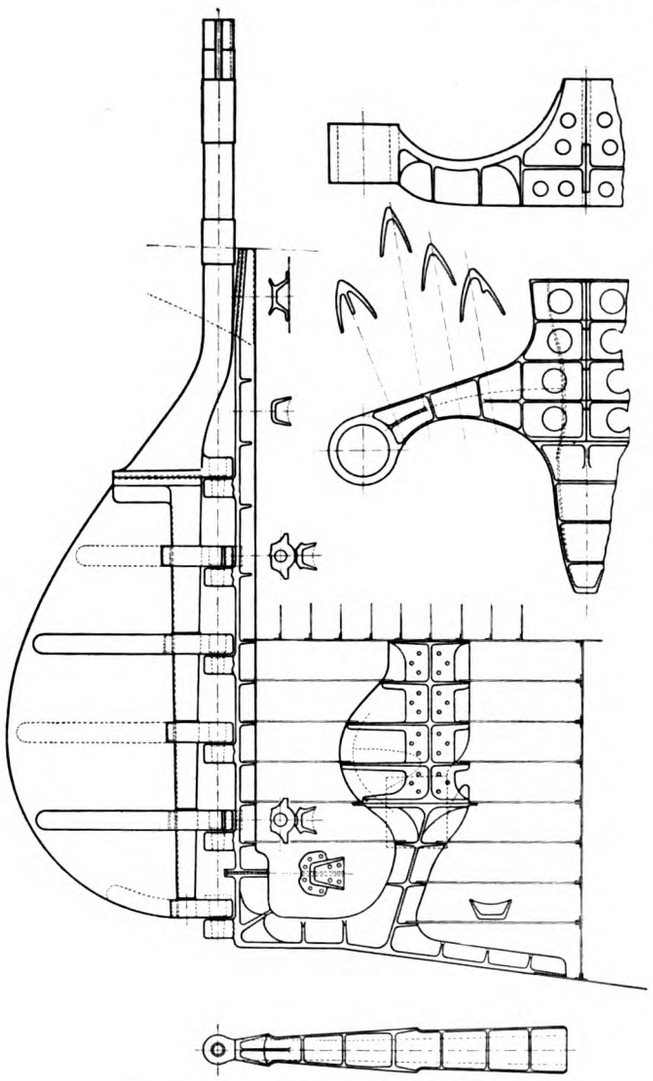

Fig. 9.—Rudder, Sternpost and Struts

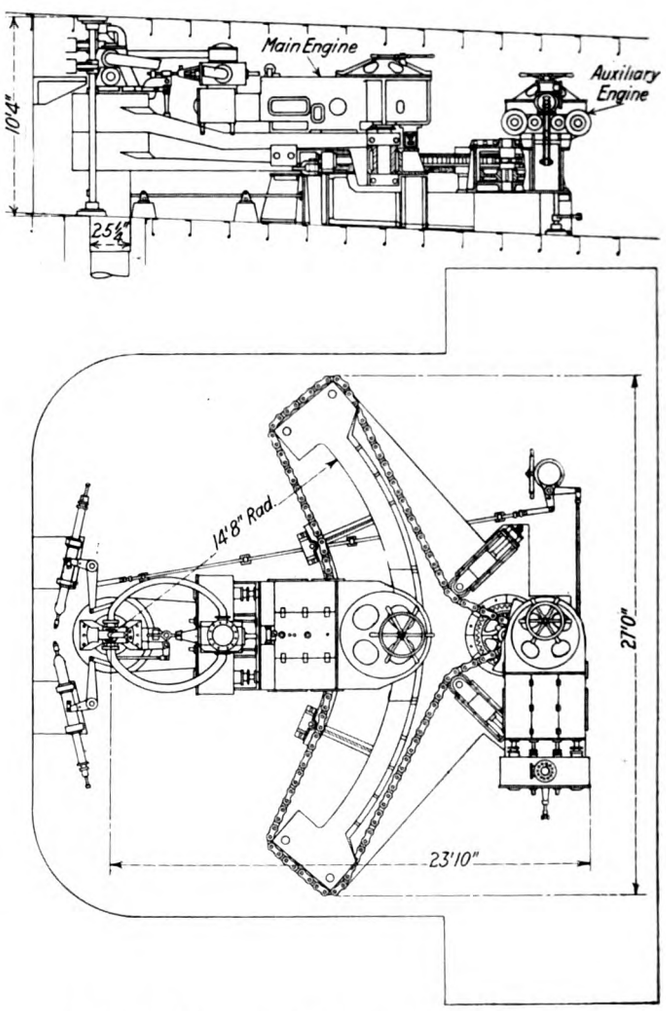

Fig. 10.—Elevation and Plan of Steering Engine

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power (500 revolutions). The brake, connected to the motor-shaft, is operated by an electric magnet. There is another type of winch for the mail lift. The mail winch is driven by an electric motor of 5 horsepower (1,200 revolutions per minute). In connection with the auxiliary machinery of the ship it is necessary to mention the hydraulic-pneumatic bulkhead door operating system (Atlas Works) which consists of 10 vertical and one horizontal doors, all of which may be operated from the bridge and also at the door itself. The refrigerating rooms are located on the third and fourth decks aft with a capacity of about 14,124 cubic feet for ship's stores

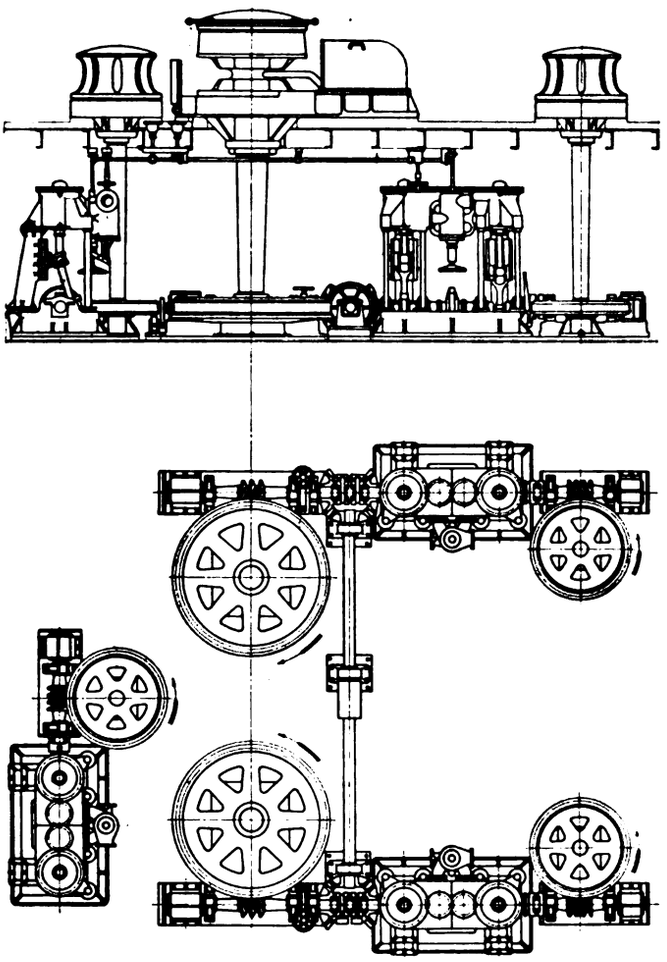

Fig. 11.—Windlass

and on the fifth deck with a capacity of over 21,186 cubic feet for stores and refrigerated cargo. There is a special refrigeration plant forward on the fifth deck with a capacity of 2,825 cubic feet and besides this there are numerous small compartments in the steward's department and for cooling fresh water in the passenger spaces. There are two independent refrigerating machines for the main plant. Besides the auxiliary machinery mentioned the following are fitted: Ten steam winches, four large steamboat winches, eight electrically driven boat winches, two provision winches, three transport winches for provisions, one electrically driven mail winch, one coal winch for galley coal, two passenger lifts for the first class of 1,326 pounds capacity, one passenger and baggage lift for the first class of 1,768 pounds capacity, two provision lifts for the provision rooms of 1,105 pounds capacity, three special lifts for the first and second class steward's departments, each 1,105 pounds capacity.

ELECTRICAL PLANT

The electric plant of the vessel is a very large one. All has been completed according to the rules of the German Standards Committee. The main plant consists of five steam-driven generators each of 140 kilowatt, 115-volt and 225 revolutions per minute, arranged in the auxiliary engine space, one steam-driven generator of 90 kilowatt, 115-volt and 225 revolutions in the main engine room on the level of the D deck, for emergency purposes. There are altogether 33 circuits for light, 20 for heating and 25 for power, all connected to the main generators. For the emergency generator there are 27 circuits for light and 14 for power and wireless telegraphic purposes. There are 5,727 incandescent lamps, 1,500 of which are in watertight fixtures. There are 56 electric motors for ventilating purposes, 24 for the steward's department, 22 for winches and lifts, 10 motors for pumps, 11 motors for workshop and one each for the printing office, gymnasium and the fire detecting system, all motors together representing about 964 horsepower. There are 229 electric heaters in the passenger accommodations and 20 for emergency purposes. There is a very elaborate telephone system throughout the vessel; complete electric bell service and more than 80 electric clocks.

The wireless equipment is of the latest Telefunken type.

A gyroscopic compass of the Anschutz type is installed, consisting of one master compass and four repeaters, all driven by two direct current motors which can be connected to either regular or emergency circuits.

Great Lakes Yards Active

LATEST reports from the Great Lakes District show considerable activity among the shipyards in the way of construction and repair work on various types of vessels as follows:

The Manitowoc Shipbuilding Company, in addition to having contracts for two steel car ferries for the Pere Marquette Railroad Company and also two steel tugs for the Great Lakes Dredge and Dock Company of Chicago, has a large number of ships in for repairs.

A contract for 550-foot Great Lakes freighter has been placed with the Collingwood (Ont.) Shipbuilding Company by the Matthews Steamship Company, Toronto, Ont.

The Northern Navigation Company has the passenger steamers *Noronic, Huronic, Hamonic* and *Thousand Islands* wintering at Sarnia, Ont., and receiving necessary repairs. The tanker fleet of the Imperial Oil Company is also at Sarnia and will be repaired there.

The Detroit Shipbuilding Company has a large force of carpenters at work on the cabins of the new passenger steamers, *Greater Detroit* and *Greater Buffalo*, which are under construction for use on the Detroit and Buffalo route next season.

In addition to contracts for a steel freighter for the Ford Motor Company and a 12,000-ton ship for Herbert K. Oakes of Cleveland, the Great Lakes Engineering Works, Detroit, Mich., has considerable repair work on hand.

The Toledo Shipbuilding Company, Toledo, O., has a large amount of repair work at its yard and, among other things, is renewing tank tops and side tanks on a number of vessels, having just launched the 12,000-ton ship *William H. Field* for the Reiss Coal Company.

The steamers *Frank E. Kirby, Scranton, Kalkaska, McLouth* and *Hazard* are at the yard of the McLouth Shipbuilding Company, Marine City, Mich., for repairs.

The Davidson Shipbuilding Company, Bay City, Mich., is making repairs on its own vessels and those of the Blogett fleet.

The C. C. Smith Sons Company, Algonac, Mich., builders of fast motor boats, reported as having a large number of contracts on hand for spring delivery.

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Cunard Liner Ascania Designed for North Atlantic Service

THE Cunard Steamship *Ascania* was launched by Sir W. G. Armstrong, Whitworth & Company, Ltd., from their Armstrong yard on December 20, 1923.

The principal dimensions and characteristics are as follows:

Length overall	538 feet 6 inches
Length between perpendiculars	519 feet 0 inches
Beam extreme	65 feet 3 inches
Beam molded	65 feet 0 inches
Depth molded to shelter deck	43 feet 0 inches
Displacement	20,730 tons
On a draft of	29 feet 5½ inches
Classification Lloyd's 100 A.1 shelter deck with freeboard class.	
Number of decks	7
Number of main watertight bulkheads	10
Twin screw turbine machinery of 8,500 horsepower.	
Four oil fuel burning cylindrical boilers working under forced draft.	
Service speed, about	15 knots
Total complement of passengers and crew, about	1,900

The vessel is destined for the North Atlantic trade and will carry cabin and third class passengers only, together with a considerable amount of cargo.

Oil fuel is carried in part of the double bottom, and in bunkers arranged between the boiler room and No. 4 hold as well as between the engine and boiler rooms. A large hold devoted to cold stores and refrigerated chambers is arranged aft of the engine room.

The cabin passengers are berthed in two and four berth rooms and the third class in two, four and six berth rooms, the majority of the third class being in rooms with four berths. Altogether, berths are provided for approximately 430 cabin passengers and 1,200 third class. The cabin dining saloon has seats for 286 persons and two third class saloons together seat 449.

The propelling machinery consists of twin screw Parsons turbines, taking superheated steam at 220 pounds pressure. Double reduction gearing is fitted. The propeller thrust is taken on Michell bearings, the propellers being of the built up type, having a cast steel boss with bronze blades.

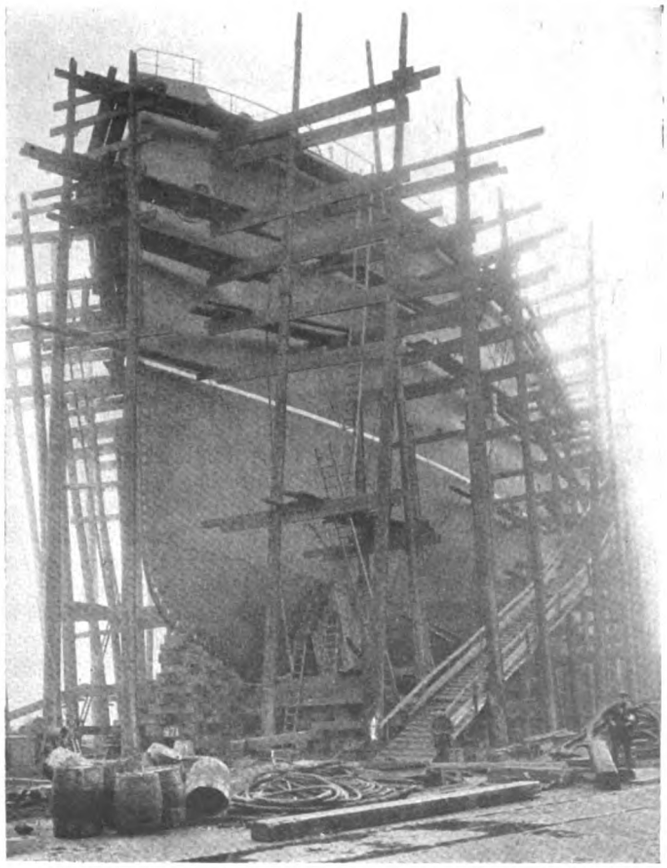
Two of the four boilers are double ended and two single ended. All are 17 feet 6 inches in diameter and arranged for coal or fuel oil firing. The latter system is equipped with burners and apparatus of the White design.

Every possible means for securing complete safety at sea has been adopted on the *Ascania* and the rules of the Board of Trade and the requirements of the International Convention on Safety of Life at Sea have been fully complied with and even surpassed.

Much attention has been given to adequate insulation of all living spaces adjacent to machinery compartments and very complete ventilation systems are fitted. Heating is effected partly by a system of steam radiators and partly through thermotanks. Hot and cold water, salt and fresh, is supplied to the baths, lavatories and domestic offices of the ship, and every stateroom has an independent supply of fresh water.

The cargo handling is provided for by twenty 5-ton derricks, served by twelve steam winches. The steering gear is worked on the hydro electric system and is controlled by telemotor gear. A complete system of telegraphs, telephones and speaking tubes is installed.

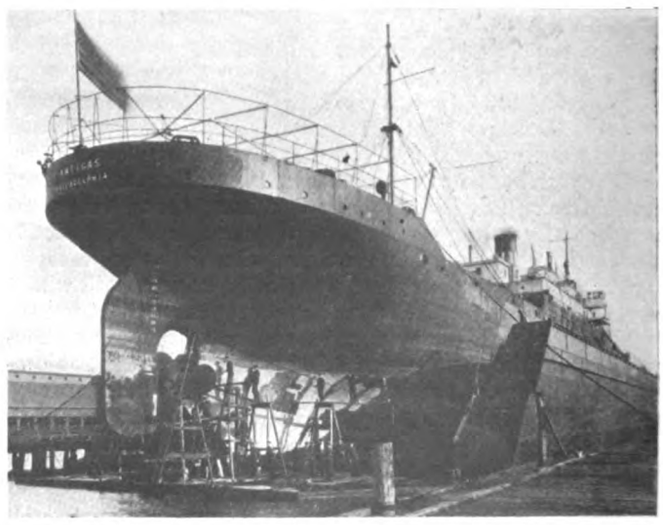
Throughout the vessel, the fittings and furnishings will be of the high character consistently maintained by the Cunard Company.



S. S. Ascania

New 8,000-Ton Floating Dry Dock in Operation at the Atlantic Works

THE new 8,000-ton floating dry dock, recently purchased by The Atlantic Works, East Boston, Mass., from the Shipping Board, can be operated at any time of the day or night irrespective of whether the tides are high or low. The dock, which is 425 feet long, 90 feet beam and capable of docking vessels having a draft of 22 feet, is operated by electrically driven pumps and is completely equipped with electric light, air, water and steam lines conveniently located for use on the dock or on board ship. The dock is rigidly secured together in one piece so that it is impossible to strain a vessel in docking.



Vessel Recently Docked on New 8,000-Ton Floating Dry Dock

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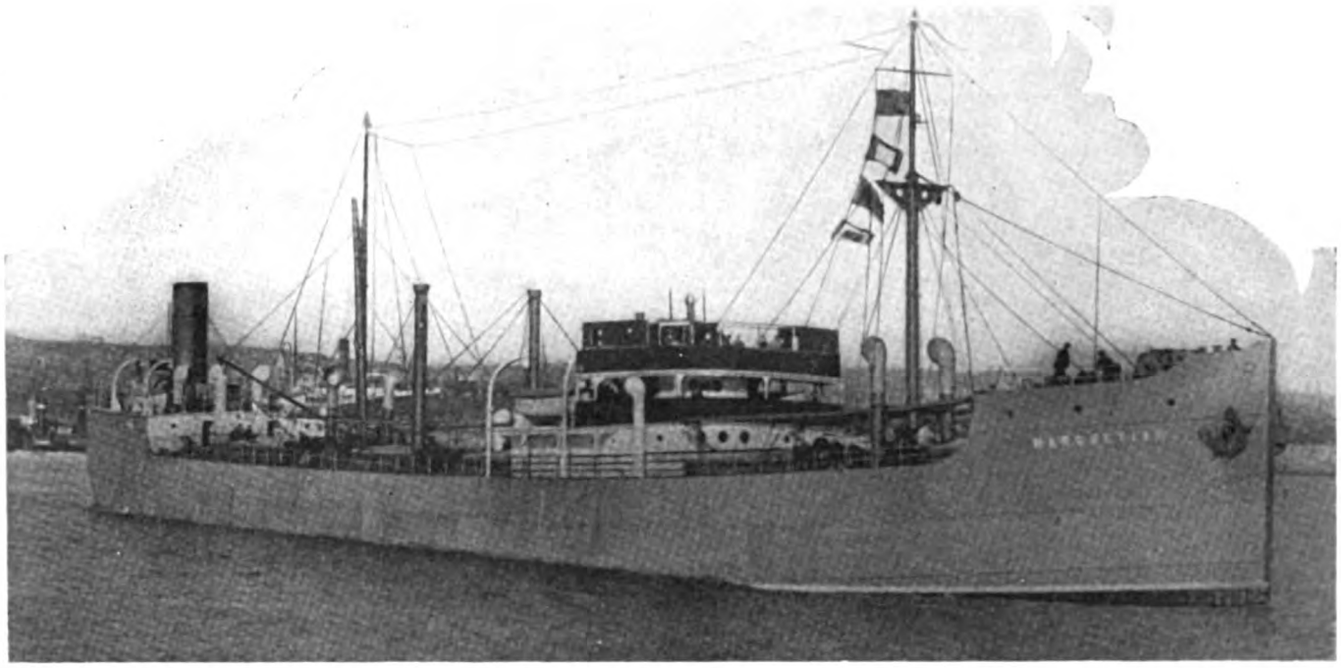

The 4,400-Ton Motorship Margretian in Which the First Engines of the New Beardmore Type Are Installed

Latest German Motor Liners Have Geared Drive

Mechanical Reduction Gears Installed with Hydraulic Transformers—M. S. Margretian Equipped with New Beardmore Oil Engine

By Our Special London Correspondent

IN spite of the internal and external troubles of Germany, she occupied last year the second position in the world in motorship building and her output of oil-engined vessels fell short of that of the United Kingdom only to a small extent. Not only is this the case, but manufacturers in Germany are showing the keenest interest in developing new ideas in connection with motorship propulsion.

At the Deutsche Werft, where Burmeister & Wain engines are built, a new super-charging system has been adopted which, by supplying combustion air to the working cylinders at a pressure of a few pounds per square inch, is claimed to increase the output between 25 and 30 percent. At the Benz Works, a remarkable six-cylinder engine with only three cranks has been developed and now taken up by the big Reiherstieg shipyard at Hamburg. With this design, weight and length, and presumably cost, have been reduced by about 25 percent.

In particular, attention has been devoted in Germany to the construction of high-powered motorships along novel lines. In other European countries, this problem is being solved by the development of single engines of the double-acting type with an output of as much as 10,000 indicated horsepower. German shipowners, however, apparently prefer to rely upon units of smaller size with which experience has already been gained. As a result mechanical gearing has been brought into use, and there is now being built at Blohm & Voss's yard for the Hamburg American Line a mixed cargo and passenger liner with this system.

Gearing has already been installed on two Hamburg American Line cargo ships, utilizing high-speed Diesel engines running at about 240 revolutions per minute geared down to 85 revolutions per minute. In the new passenger liner, however, there will be four engines each of about 2,500 brake horsepower geared in pairs to a single shaft so that the vessel will be a twin-screw ship. The engines will run at about 200 revolutions per minute thus being considerably lighter than Diesel motors of normal marine type operating at 100 revolutions per minute. The mechanical gearing will give a ratio of about 2 to 1.

The Use of Hydraulic Transformers

It is thought in some quarters that the use of gearing with Diesel engines is undesirable, owing to the severe shocks that may occur on the teeth of the gear wheels. For this reason, therefore, the Vulcan works have brought out a new system of geared drive for motorships, the first application of which will be seen in a big vessel with machinery of 8,000 brake horsepower. Instead of driving the gearing direct, a hydraulic transformer is interposed between the engine and the spur wheels. The object of this is manifold. It absorbs the shocks that might otherwise be taken on the teeth and moreover affords a means of reversing the direction of rotation of the propeller without changing that of the engine. Thus the reversing mechanism on the Diesel engine is eliminated, besides which compressed air is not utilized for maneuvering, since the engines can be left running and disconnected from the propeller shafts.

It may be remembered that hydraulic transformers of the

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Föttinger type have been produced by the Vulcan Works in large turbine ships and they have not perhaps been very successful. It should be pointed out, however, that in the new arrangement for motor vessels there is no actual reduction of speed attained through the employment of the hydraulic transformer, since it was found that this involved a loss of efficiency of about 9 percent. It is hoped that with this hydraulic transformer in combination with mechanical gearing the overall mechanical efficiency will not be less than 95 percent. The arrangement employed in the motorship under construction with machinery of 8,000 horsepower will be to have four separate engines of 2,000 horsepower geared through the couplings and mechanical gearing to two propeller shafts.

Machinery of an entirely novel design has just been installed in a new British motorship, the *Margretian*. This is a vessel of about 4,400 tons deadweight (310 feet long overall) and she is equipped with the first examples of the new design of Beardmore oil engine which can best be described as something of a compromise between the Diesel and the semi-Diesel motor. A Diesel engine for relatively small powers is expensive, while the semi-Diesel engine has not yet gained favor for sizes above 400 horsepower. In the *Margretian* are two 600 brake horsepower six-cylinder sets and it is claimed that they have the cheapness and simplicity of the semi-Diesel motor with equal fuel consumption to that of the Diesel engine.

They are two-stroke motors with cylinders 18 inches diameter and 24 inches stroke, the speed being 185 revolutions per minute. Scavenging air is supplied by crankchamber compression, which is the system usually adopted in semi-Diesel engines, but the compression pressure is 300 pounds per square inch, against something under 200 pounds per square inch with the hot-bulb engine and nearly 500 pounds in a Diesel motor.

A unique feature lies in the employment of a piston in two sections, the head being of aluminum alloy. Apart from experimental engines, this is the first time that aluminum has been used for big motors of this class. The fuel pumps are driven from the crankshaft and are timed for the injection of fuel so that the valves in the cylinder head are automatic. The fuel is injected into a spherically shaped head which is water-cooled, and to provide quick starting, an electric plug is fitted in this head. Electric current is passed around a resistance which heats the bulb sufficiently to enable the bulb to be started up in a few seconds from cold.

It may be taken that this new Beardmore motor is a development of what is usually termed the high compression oil engine that has achieved much success for stationary work in Great Britain. Its chief advantage in comparison with the Diesel engine is that its cost is very much lower. This may be gaged from the fact that the total weight of one 600 brake horsepower engine is 45 tons or 90 tons for the twin-screw installation. Had a Diesel engine of 1,200 brake horsepower been fitted in this ship, the weight would have been well over 150 tons. The fuel consumption is about 0.43 pound per brake horsepower hour, which is only slightly in excess of that of the pure Diesel type. It would seem, therefore, that should the new design prove satisfactory in service it will compete to a certain extent with Diesel engines, at any rate for installation in ships where a power of not more than about 1,500 brake horsepower is needed.

Installing a Propeller and Tail Shaft Under Difficulties

By A. F. Menzies

DURING a voyage, in ballast, from Panama to Vancouver, B. C., the steamship *Ariaga Mendi* had a rather unique propeller failure. In quite fair weather, with a smooth sea, the tail shaft broke just aft of the stern tube and the propeller went to the bottom. It is not uncommon to hear of a tail shaft breaking in rough weather or through the propeller striking a submerged object; but to have the wheel drop off without saying good-bye is rather uncanny.

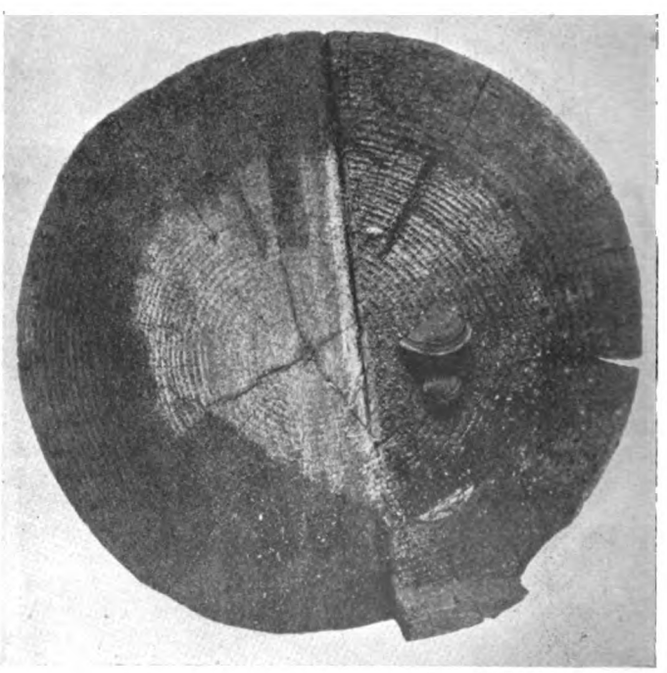
As the vessel was absolutely helpless, a tow from a Mexican steamer was accepted and the *Ariaga Mendi* brought to anchor in a small harbor on the Mexican coast, where the work of installing the spare shaft and propeller was done. No shore facilities being available, the work had to be carried out by the ship's crew and with the gear on board.

The vessel was tipped until the draft aft was reduced to about 7 feet, when the broken shaft was drawn into the tunnel and the spare shaft pushed out into place. An examination of the broken shaft showed that it had given way at the after end of the liner and had broken almost square. There was no sign of corrosion, but about one-third of the area showed very coarse grained material.

To handle the spare propeller over the side and into position, the heavy cargo boom provided on the foremast was taken aft and rigged in a suitable position.

The vessel's crew being all Spaniards and the writer not being able to converse in that language, it was not possible to get a detailed account of the methods used to overcome the numerous difficulties which would be bound to arise in a job of this nature. Great credit is due to the engineers who were able to carry it out, with the limited facilities provided. By working day and night they were able to complete the job and have the vessel under way in 10 days.

On arrival at Vancouver all that remained to be done was to ream out the coupling bolt holes, make and fit a new set of bolts and adjust the after line shaft bearing. This part of the job was carried out by the Wallace Shipbuilding and Dry Dock Company, Limited, of North Vancouver.



Fungus Attack on Cut End of Treated Pile

The photograph, supplied by Forest Products Laboratory, U. S. Forest Service, Madison, Wis., shows a wood-destroying fungus growing in the untreated wood exposed by cutting off the end of a creosoted pile. The end was given no protective treatment after it had been cut. After the end of a creosoted timber is trimmed, it should be brushed with hot creosote at once to hold back the growth of the fungus, if in the wood, or, prevent infection afterward.

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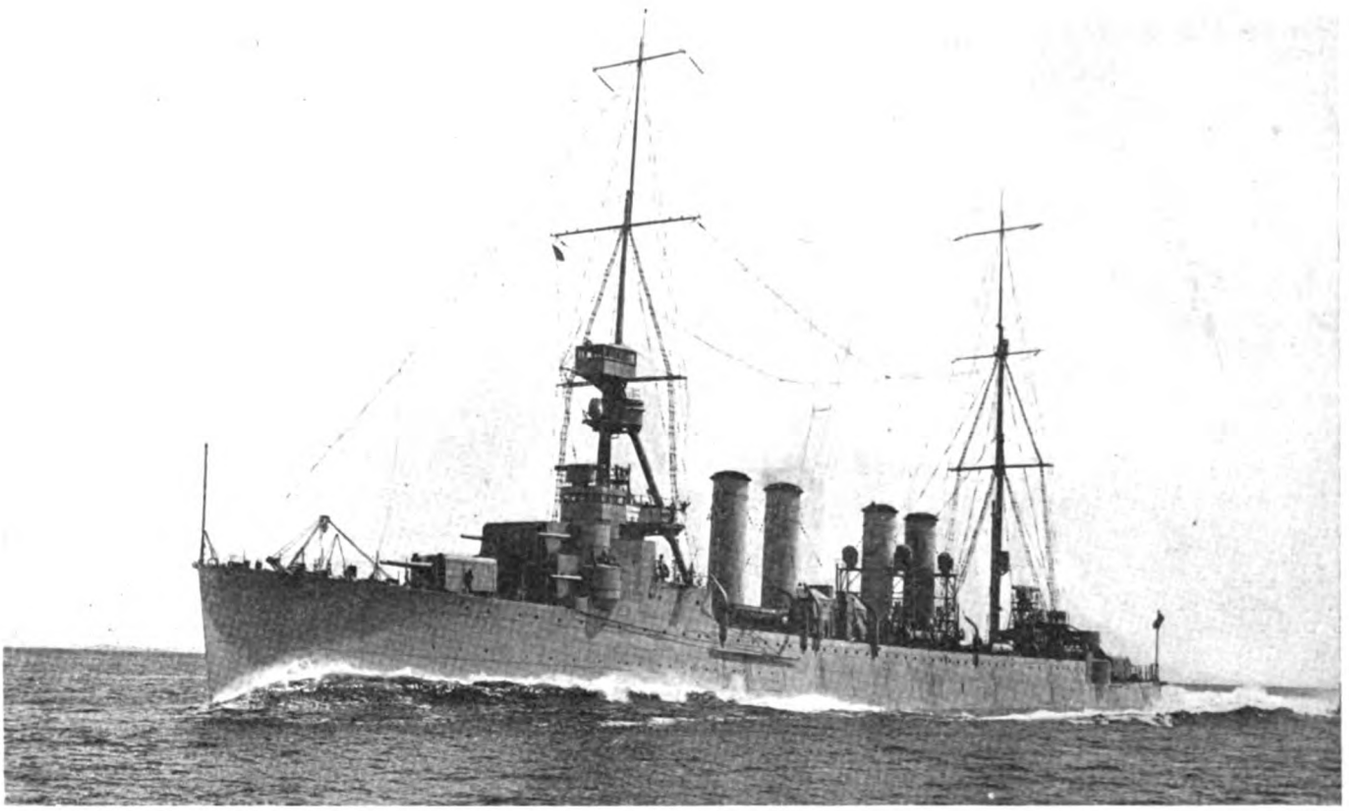

Scout Cruiser Raleigh on Her Official Trials

Scout Cruiser Raleigh Completes Official Trials

THE United States scout cruiser *Raleigh,* which is being built by the Bethlehem Shipbuilding Corporation at Quincy, completed her official trials on December 22. In both the preliminary and official trials, this vessel made every test in such a manner that both the builders and Navy officials state that she has excelled her sister ship the *Detroit,* which was delivered to the Navy a short time ago. The *Raleigh* carries all of the latest improvements, which make her the most modern vessel of her type afloat.

The *Raleigh* is 550 feet in length with a breadth of 55 feet and a normal load displacement of 7,200 tons. She carries twelve 6-inch rapid fire guns of the very latest model, four 3-inch anti-aircraft guns, capable of firing into the air at any angle up to 90 degrees; she also carries 10 torpedo tubes and 200 mines which can be launched in a very few minutes. This vessel is also fitted to carry airplanes, which can be launched from a revolving catapult while running either with or against the wind. She is also equipped with high power radio apparatus, wireless telephone, submarine signaling and electric steering gear; she also has a fully equipped hospital, laundry, workshops, etc.

The propeller machinery, which was designed and constructed by the builders, developed 100,000 shaft horsepower on her trial which is sufficient to drive this vessel at a speed of better than 41 statute miles per hour. The main propelling machinery consists of twelve oil-fired watertube express type boilers, three being located in each of the four watertight compartments and operated under forced draft. There are two watertight engine room compartments amidships in which are located the main Curtis type marine turbines, which operate at a speed of 2,500 revolutions per minute which is reduced through reduction gears on each of the four propeller shafts to a speed of 400 revolutions per minute.

The steam is generated at a rate of 1,005,000 pounds per hour with a pressure of 265 pounds per square inch. The four main condensers located in the engine room require 70,000,000 pounds of sea water per hour to condense the exhaust steam from the turbines. At full speed the boilers will consume about 100,000 pounds of oil per hour.

The *Raleigh,* which was scheduled for delivery to the Navy Department in January, will be under the command of Captain W. C. Watts, who will have as his staff officers Commander R. N. Brainard, and Lt.-Comdr. H. R. Keller. These officers, together with Captain Schlabach, naval constructor, and Commander Bean, inspector of machinery, and General Manager S. W. Wakeman, of the Fore River Plant, accompanied the trial board on the trial trip.

The wonderful showing that the *Raleigh* made during these trials is a high tribute to both the naval inspectors, and the management of the Fore River Plant.

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Machinery Trials, Coast Guard Cutter Modoc*

Description of Methods and Apparatus Employed and Complete Trial Data of 16-Knot, Electrically Driven Vessel of 1680 Tons Displacement

By Captain Q. B. Newman†

THE Coast Guard cutter *Modoc* is a single-screw steel vessel, fitted with turbo-electric propelling machinery. She is one of four similar vessels built at the works of the Union Construction Company, Oakland, California. They were designed for a speed of 16 knots with the main motor developing 2,600 shaft horsepower. The other three vessels of the class are the *Tampa, Haida* and *Mojave.*

Principal Hull Dimensions

Length overall	240 feet 00 inches
Length on waterline	220 feet 00 inches
Beam, molded	39 feet 00 inches
Mean draft to trial waterline	14 feet 03 inches
Displacement, 14 foot 3 inch waterline, tons	1,680
Tons per inch immersion at 14 foot 3 inch waterline	13.34
Block coefficient, 14 foot 3 inch waterline	0.480
Prismatic coefficient, 14 foot 3 inch waterline	0.536
Midship section coefficient, 14 foot 3 inch waterline	0.888
Area of midship section, square feet, 14 foot 3 inch waterline	493.0
Area of wetted surface, square feet, 14 foot 3 inch waterline	9,600

Model tank results are shown in Fig. 24, body plan in Fig. 22, and displacement curves in Fig. 23.

Service History

The *Modoc* was placed in commission at Oakland, California, on January 14, 1922. Since that time she has cruised 33,295 nautical miles. Her last overhaul period was November 16 to 28, 1922. At the time of the tests described herein, July 17 to August 22, 1923, she had just returned from duty on the International Ice Patrol, where she had been actively cruising for four months. The condition of the machinery at the time of the tests was such as should be expected of a vessel under service conditions, and no preliminary repairs were made to the machinery, other than to clean the boilers and grind one or two pump rods which had been scored. A special overhaul in anticipation of the tests would have defeated the object in view.

The installation of the necessary piping, tanks, etc., was made at Bath, Maine. Preparations for the test were begun immediately after her arrival there from the Ice Patrol, and all tests except the under-way trials were run as soon as preparations were completed. The propeller was standardized on the Provincetown course immediately preceding the under-way trials.

Personnel

The *Modoc* is under the command of Commander B. M. Chiswell, U. S. Coast Guard, and the engineer officer is Lieutenant Commander Robert B. Adams, U. S. Coast Guard.

The following gentlemen were official witnesses of the tests, representing organizations which had been invited to participate: Mr. Charles P. Wetherbee, representing the Society of Naval Architects and Marine Engineers; Mr. J. L. Wilson, representing the American Bureau of Shipping; Mr. C. T. Jefferson, representing the U. S. Shipping Board. Captain Elliot Snow, C. C., U. S. Navy, on duty at the Massachusetts Institute of Technology, witnessed part of the trials.

The observers were the commissioned and warrant officers and enlisted men of the engine department of the *Modoc,* thirty cadets from the Coast Guard practice ship *Alexander Hamilton,* four representatives of the General Electric Company, and four representatives of the Babcock and Wilcox Company.

Object of Trials

The object was to determine in detail what becomes of the heat derived from the fuel burned in the boilers, both under way and in port; with the ultimate object of ascertaining the individual efficiency of each piece of apparatus, whether efficiencies may be improved, and whether or not any apparatus or method employed on board is sufficiently inefficient to warrant its rejection.

Apparatus Employed

Water Measuring Tank.—A three-compartment measuring tank. Depth of water in tank before and after each filling and at start and stop was recorded. This was a three-compartment tank, each compartment holding about 520 gallons.

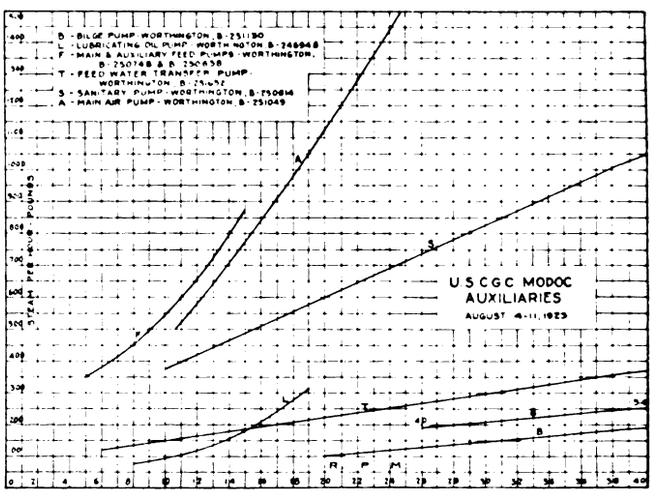

Fig. 1.—Steam Consumption of Auxiliaries

There was a gage glass on each compartment, and a fixed scale, graduated in tenths of an inch, alongside the glass. The temperature of the water at the time the tanks were calibrated was 56 degrees F. Compartments Nos. 1 and 2 were fitted with 4-inch plug cocks and levers for filling and discharging, and these compartments were used for measuring condensate. Compartment No. 3 was used for make-up feed. It was filled before each test through a manhole in the top, and discharged through a 1-inch pipe to the feed tank, with a valve in the fireroom. Extra feed was taken as necessary to maintain a constant water level in the boilers. The water evaporated by the boilers was the water discharged from compartments Nos. 1 and 2, plus the water taken from compartment No. 3, plus or minus the decrease or increase of water in the feed and filter tank, plus or minus the decrease or increase of water in the boilers. The accuracy of measurement of feed water was one of the matters which caused apprehension in the beginning, but after a little practice no difficulty was actually experienced.

Feed Water Transfer System.—A small open-top tank installed in the fireroom. The air pump discharge was introduced into the top of this tank and an effort was made to

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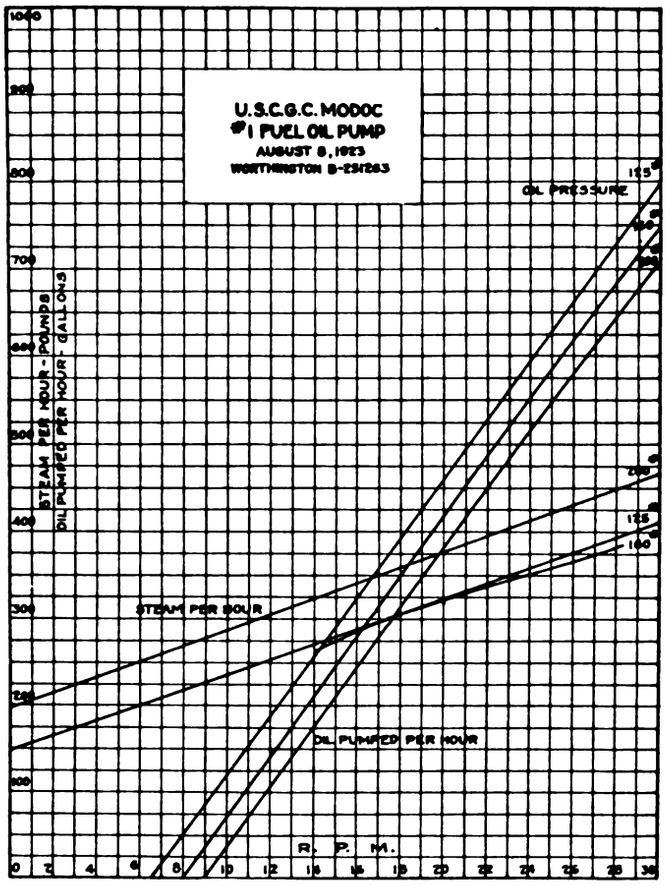

Fig. 2.—Performance of No. 1 Fuel Oil Pump

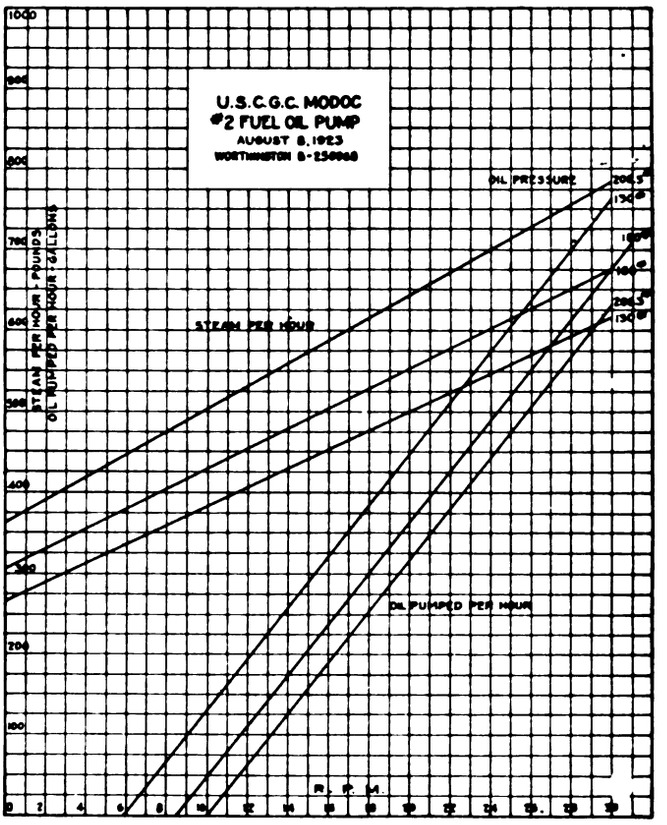

Fig. 3.—Performance of No. 2 Fuel Oil Pump

keep the tank at about a constant level. The oil cooler circulating pump, which is never used, was transferred temporarily to the fireroom and installed so as to take water from the transfer tank and deliver it to the water measuring tanks on the upper deck. The speed of the pump was manually controlled. From the water measuring tanks, the water was transferred by gravity through the feed water meters to the filter tank.

Fuel Oil.—A two-compartment measuring tank. This tank was inserted in a 2½-inch suction line from bunkers. Oil flowed into the measuring tank by gravity. The tank was provided with filling and discharge cocks and levers, and each compartment had a water gage glass and a scale to indicate the weight of oil in the compartment. The tank was calibrated in pounds by filling with oil which was then drawn off and weighed, inch by inch. This gave the net weight of oil, eliminating from consideration oil which adhered to walls of tank, and permitted the scales to be marked direct in pounds

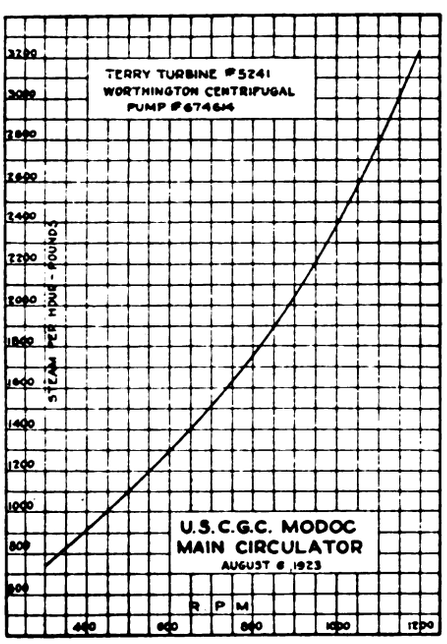

Fig. 4.—Main Circulator

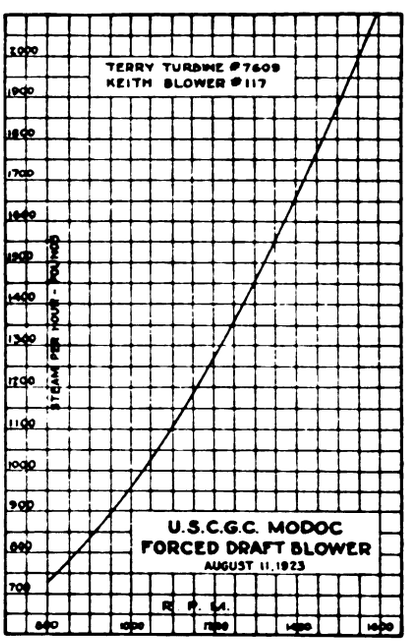

Fig. 5.—Forced Draft Blower

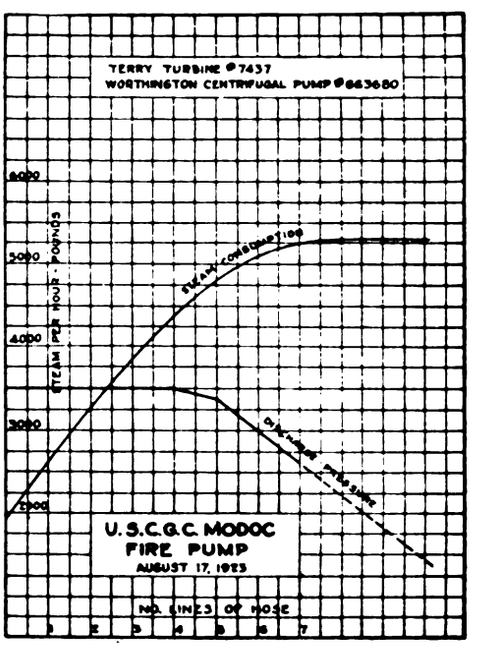

Fig. 6.—Fire Pump

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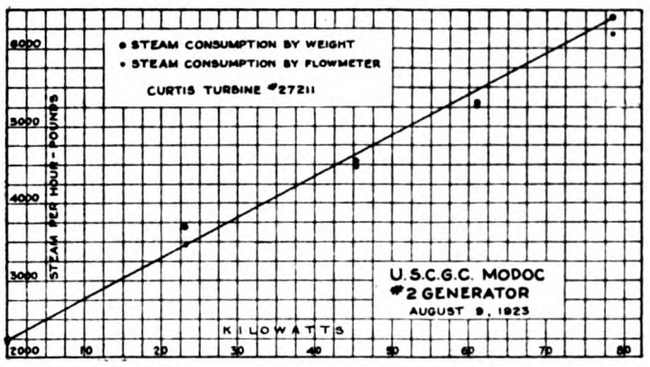
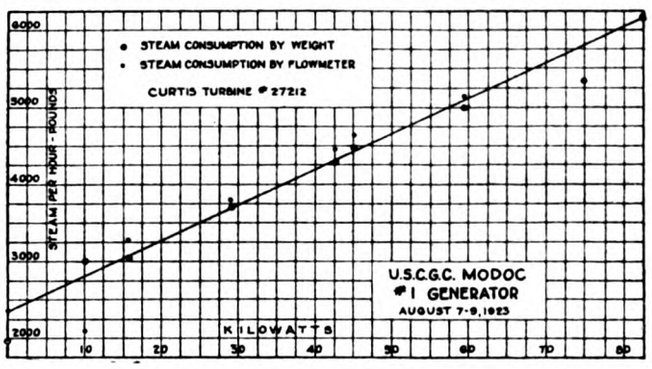
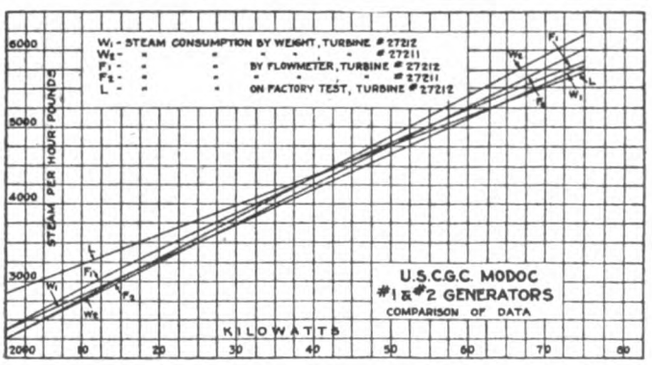
of fuel. Water was used in the gage glasses to avoid smearing with oil.

Steam Flow Meters.—Two steam flow meters in the auxiliary steam piping in the fireroom, one port and one starboard.

Electrical Instruments.—Electrical measurements were made with instruments carefully selected and checked in the General Engineering Laboratory of the General Electric Company, Schenectady, New York. The following instruments were used:






W1 - STEAM CONSUMPTION BY WEIGHT, TURBINE #27212
W2 - " " " " #27211
F1 - " " BY FLOWMETER, TURBINE #27212
F2 - " " " " #27211
L - " " ON FACTORY TEST, TURBINE #27212
U.S.C.G.C. MODOC
#1 & #2 GENERATORS
COMPARISON OF DATA
STEAM PER HOUR - POUNDS
KILOWATTS

Figs. 7, 8 and 9

Main propulsion apparatus (see Fig. 12):

2 current transformers 500/5 amperes ..... 100:1 ratio
2 potential transformers 2200.110 volts ..... 20:1 ratio
2 indicating wattmeters 5/10 amperes, 150 volts .. 500/1000 watts
2 indicating ammeters ..... 5/10 amperes
2 indicating voltmeters ..... 75/150 volts
2 rotating standard watthour meters 5 amperes, 110 volts, 25 cycles.

All of the above instruments were used during the tests from 10 knots to maximum speed. For the 6 and 8-knot tests two special low reading wattmeters were used as follows in place of the wattmeters listed above:

6 Knots:

Phase 1-2, 1 indicating wattmeter, 3 amperes, 50 volts, 50 watts.
Phase 2-3, 1 indicating wattmeter, 5 amperes, 50 volts, 150 watts.

8 Knots:

Phase 1-2, 1 indicating wattmeter, 5 amperes, 50 volts, 150 watts.
Phase 2-3, 1 indicating wattmeter, 5/10 amperes, 150 volts, 500/1000 watts.

The indicating wattmeters were used for determining the power output of the generator. It was originally intended to use the wattmeters on the standardization runs and the rotating standards on the sea trials if the sea was heavy, in which case the rotating standards were to be checked in place. Since all of the tests were made in a smooth sea it was not necessary to make use of the rotating standards. When using the two wattmeter method of measuring power in a 3-phase, 3-wire circuit and with unity power factor and balanced circuits, each wattmeter will indicate half the total power. At 50 percent power factor, one instrument will indicate the total power, the other instrument reading zero. This should be remembered in examining the A-C data in Table 5.

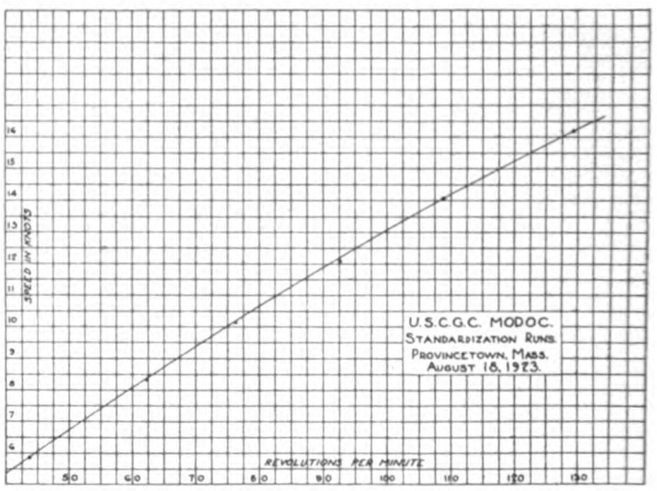


Fig. 10.—Standardization Runs

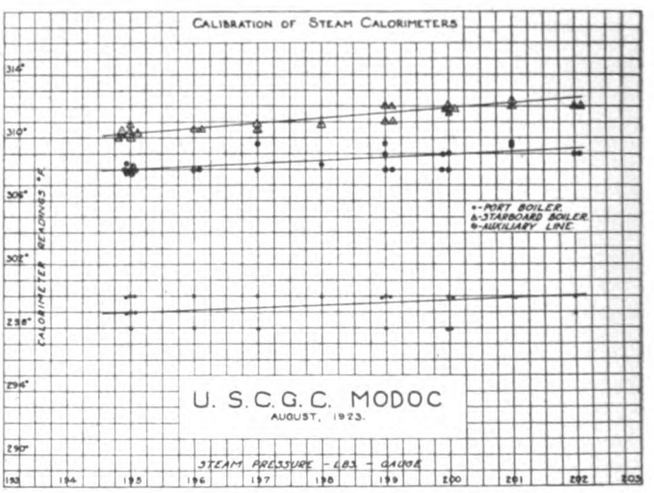


Fig. 11.—Calibration of Steam Calorimeters

For measuring the fields of the main generator and motor the following instruments were used (see Fig. 13):

2 shunts, 300 amperes, and 2 indicating millivoltmeters.
2 indicating voltmeters, 150 volts, connected across the field slip ring.
2 indicating voltmeters, 150 volts, connected across the exciter.

For measuring the temperature of the armature of the main generator and motor the following were used (see Figs. 14, 15, 16):

1 indicating temperature indicator, 20 to 120 degrees C., 110 volts and ten sets of leads, connecting with coils in the armature of the machines.

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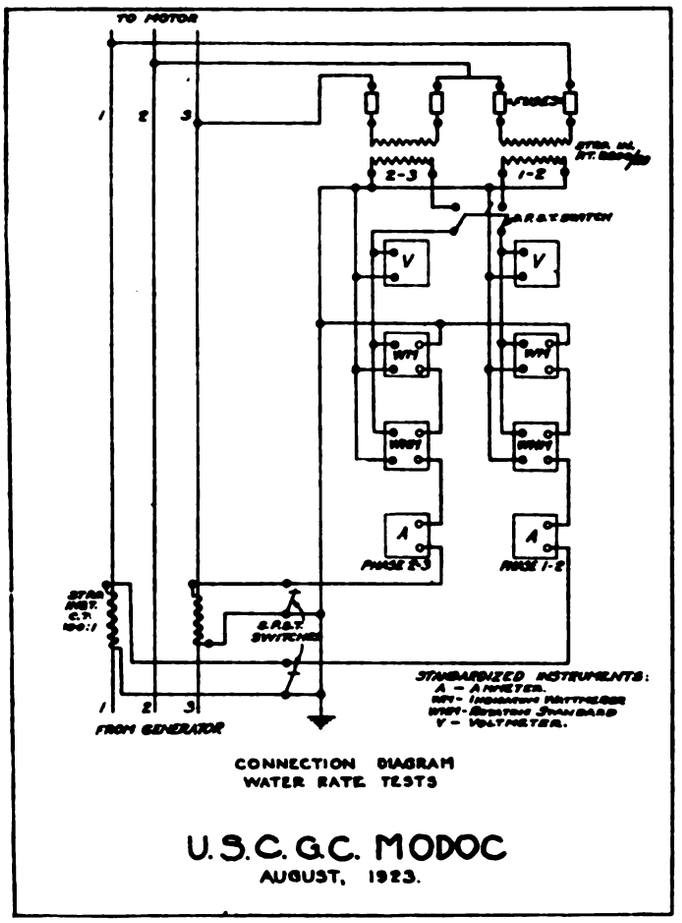

Fig. 12

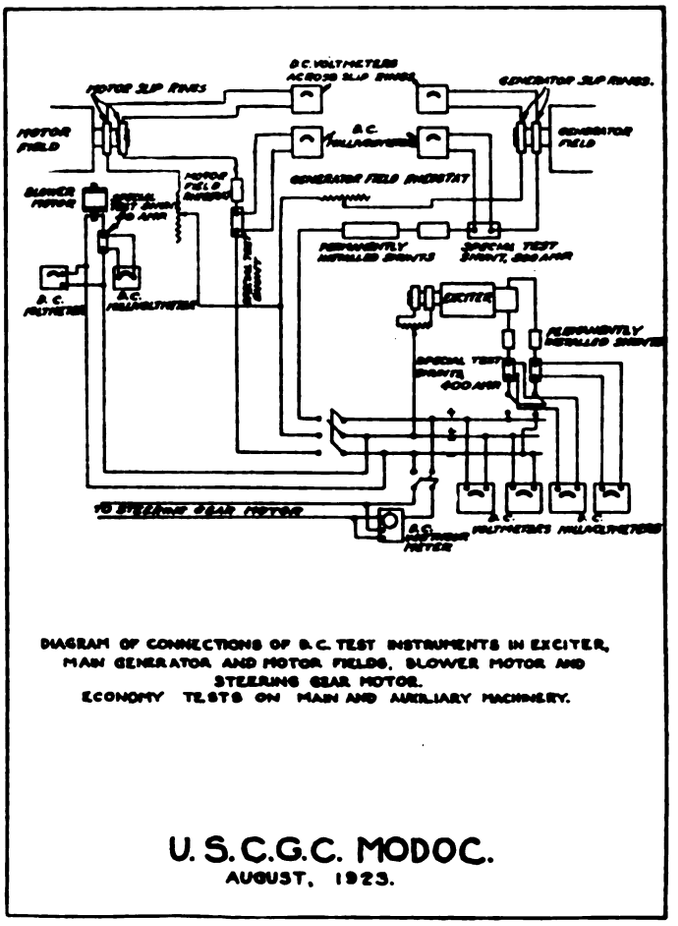
DIAGRAM OF CONNECTIONS OF D.C. TEST INSTRUMENTS IN EXCITER, MAIN GENERATOR AND MOTOR FIELDS, BLOWER MOTOR AND STEERING GEAR MOTOR.
ECONOMY TESTS ON MAIN AND AUXILIARY MACHINERY.
U.S.C.G.C. MODOC.
AUGUST, 1923.

Fig. 13

1 indicating voltmeter, 150 volts for holding proper voltage across temperature indicator.

14 thermometers, 160 degrees C. to measure the temperature of the ingoing and outgoing air.

Auxiliary 75 K. W. D. C. Generators. Exciters Nos. 1 and 2 (see Fig. 13):

2 shunts, 400 amperes, and two indicating millivoltmeters for each unit.

2 indicating voltmeters, 150 volts for each unit.

Ventilation Motor (see Fig. 13):

1 shunt, 50 amperes and indicating millivoltmeter.
1 indicating voltmeter, 150 volts.

Steering Gear Motor:

1 D. C. rotating standard watthour meter, 100 amperes, 220 volts.

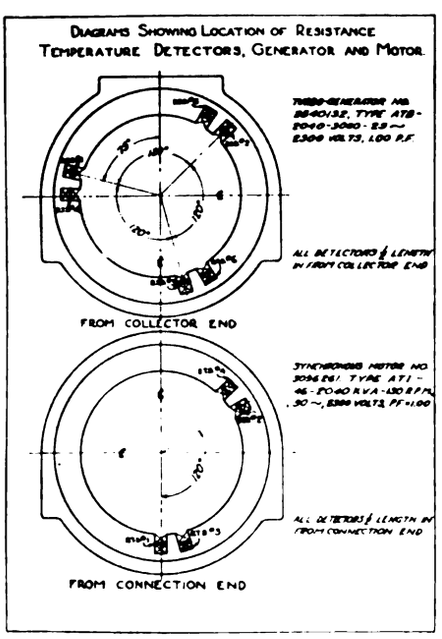
DIAGRAMS SHOWING LOCATION OF RESISTANCE TEMPERATURE DETECTORS, GENERATOR AND MOTOR.
FROM COLLECTOR END
FROM CONNECTION END

Fig. 14

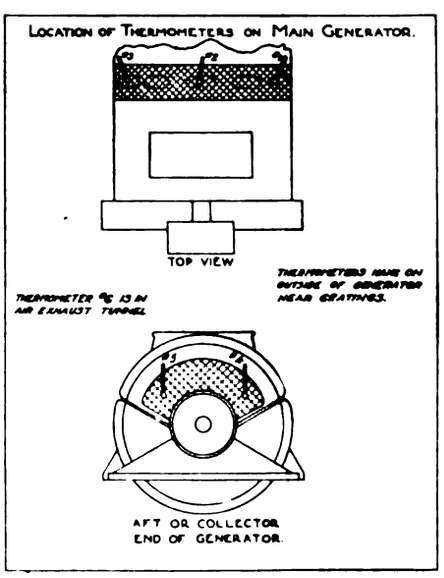

Fig. 15

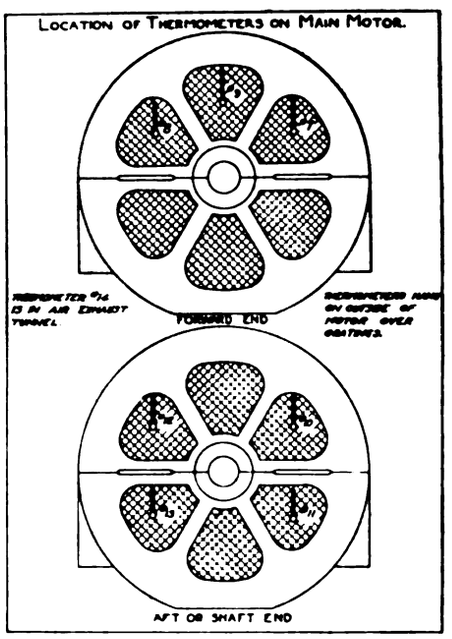

Fig. 16

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Table 1

U.S.C.G.C. MODOC - AUXILIARY DATA - AUGUST 1923

#1 GENERATOR

RUN NO.	PRESSURES STEAM	EXH.	R.P.M.	VOLTS POS.	VOLTS NEG.	AMPERES POS.	AMPERES NEG.	K.W.	CONDS. LBS/HR
1	197	8	1210	120.8	120.0	25.6	58.8	10.15	3000
2	200	8	1205	120.7	119.8	54.5	78.2	15.92	3040
3	198.3	8	1195	121.0	119.6	103.2	140.8	29.33	3680
4	197	8	1190	121.2	119.7	172.2	202.8	45.2	4470
5	197	8	1220	—	—	—	—	NO LOAD	1960
6	201	8	1142	119.4	120.0	346.8	345.6	82.88	6170
7	203	8	1190	119.1	118.9	179.4	180.4	42.82	4280
8	200	8	1185	118.4	118.1	251.9	251.2	59.49	4980

Drawing No. 22

#2 GENERATOR

RUN NO.	PRESSURES STEAM	EXH	R.P.M.	VOLTS POS.	VOLTS NEG.	AMPERES POS.	AMPERES NEG.	K.W.	CONDS. LBS/HR
1	202	8	1190	—	—	—	—	NO LOAD	2230
2	200	8	1170	122.3	120.7	94.8	95.6	23.13	3690
3	202	8	1140	121.1	119.9	188.4	188.8	45.46	4530
4	201	8	1110	120.0	119.7	254.8	254.5	61.04	5300
5	200	8	1095	120.2	120.0	327.6	326.6	78.57	6410

Drawing No. 23

FORCED DRAFT BLOWER

RUN NO.	PRESSURES STEAM	EXH.	R.P.M.	AIR PRESS. IN/WATER	REGR. OPEN'G.	CONDS. LBS/HR.	TEMP. AIR °F
1	125	8	791	0.75	2/8	735	110
2	125	8	1307	1.50	2/8	1490	110
3	150	8	1548	2.12	2/8	1900	110
4	150	8	869	0.75	4/8	810	110
5	150	8	1258	1.50	4/8	1350	110
6	150	8	1542	1.80	4/8	2040	110
7	150	8	998	0.75	6/8	930	110
8	150	8	1418	1.50	6/8	1710	110
9	150	8	1540	1.80	6/8	1950	110

Drawing No. 24

MAIN CIRCULATOR

RUN NO.	PRESSURES STEAM	EXH.	R.P.M.	CONDS. LBS/HR
1	125	8	306.4	735
2	125	8	614.6	1310
3	125	8	877	2090
4	125	8	900	2090
5	125	8	1157.5	3020
6	125	8	1160	3140

Drawing No. 30

AUXILIARY FEED PUMP

RUN NO.	PRESSURES STEAM	EXH.	R.P.M.	CONDS. LBS/HR
1	200	8	5.5	275
2	200	8	7.2	435
3	175	8	10.5	565
4	200	10	12.0	615
5	200	14.6	14.5	850
6	198.2	10.2	12.5	695

Drawing No. 29

#1 FUEL OIL PUMP

RUN NO.	PRESSURES STEAM	EXH.	DISCH.	R.P.M.	CONDS. LBS/HR
1	190	8	125	9.8	235
2	198.7	8	125	19.2	315
3	198	8	125	23.8	355
4	197.3	8	160	14.2	265
5	197	8	160	18.0	305
6	196	8	160	28.3	385
7	197	8	200	14.9	335
8	192	8	200	18.5	355
9	194.7	8	200	25.2	425

Drawing No. 25

#2 FUEL OIL PUMP

RUN NO.	PRESSURES STEAM	EXH.	DISCH.	R.P.M.	CONDS LBS/HR
1	200	8	130	9.7	375
2	191.6	8	130	23.0	535
3	198.8	8	130	28.0	590
4	204	8	180	9.0	415
5	200	8	180	18.2	575
6	197.5	8	180	31.0	665
7	204.7	8	205	10.3	505
8	200	8	207	21.8	675
9	200	10	208	27.5	745

Drawing No. 26

MAIN AIR PUMP

RUN NO.	PRESSURES STEAM	EXH.	R.P.M.	VAC.	CONDS LBS/HR
1	193.3	8	12.0	26.77	572
2	200	8	17.3	27.28	947
3	200	8	16.8	27.23	862
4	200	8	24.8	27.80	1472
5	200	8	22.7	26.76	1352
6	200	8	23.0	26.90	1332
7	200	8	23.7	27.90	1462

Drawing No. 27

MAIN FEED PUMP

RUN NO	PRESSURES STEAM	EXH.	R.P.M.	CONDS. LBS/HR
1	200	8	6.8	395
2	200	8	9.5	515
3	200	10	11.8	640
4	200	13	14.7	870

Drawing No. 28

BILGE PUMP

RUN NO.	PRESSURES STEAM	EXH.	DISCH	R.P.M.	CONDS. LBS/HR
1	125	8	5	75.	367.5
2	125	8	5	34.5	170.0
3	125	8	3	22.	107.5
4	125	8	2	37.	177.5
5	125	8	—	52.5	217.5
6	125	8	—	70	305.0

Drawing No. 31

FIRE PUMP

RUN NO.	PRESSURES STEAM	EXH.	DISCH.	LINES HOSE	CONDS LBS/HR
1	125	8	70	1	2680
2	125	8	70	2	3300
3	125	8	70	3	3650
4	125	8	70	4	4470
5	125	8	67	5	5190
6	125	8	60	6	5060
7	126	8	52	7	4930

Drawing No. 32

SANITARY PUMP

RUN NO.	PRESSURES STEAM	EXH.	DISCH.	R.P.M.	CONDS LBS/HR
1	125	8	20	10.6	382.5
2	125	8	25	17.7	542.5
3	125	8	29.8	23.1	675.0
4	125	8	35	29.3	807.5

Drawing No. 33

LUBRICATING OIL PUMP

RUN NO.	PRESSURES STEAM	EXH.	DISCH	R.P.M.	CONDS. LBS/HR
1	125	8	47	14.3	165
2	125	8	47	8.25	575
3	125	8	75	16.0	285
4	125	8	28	13.5	137.5
5	125	8	80	18.3	285

Drawing No. 34

TRANSFER PUMP

RUN NO.	PRESSURES STEAM	EXH	DISCH.	R.P.M.	CONDS LBS/HR
1	200	8	—	12.7	115
2	200	8	—	17.5	195
3	200	8	—	21.7	255
4	200	8	—	40.0	345

Drawing No. 35

TABLE 2.—BOILER DATA—U. S. C. G. C. *MODOC*—AUGUST, 1923

		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
1	Run								
2	Date	Aug. 20, '23	Aug. 20, '23	Aug. 20, '23	Aug. 21, '23	Aug. 21, '23	Aug. 21, '23	Aug. 21, '23	Aug. 22, '23
3	Duration	9.45 A. M. 11.45 A. M.	1.15 P. M. 3.15 P. M.	4.00 P. M. 6.00 P. M.	7.45 A. M. 8.45 A. M.	10.00 A. M. 12.00 N.	1.15 P. M. 3.15 P. M.	4.15 P. M. 6.15 P. M.	10.00 A. M. 12.00 N.
4	Steam press. drum-gage	199.6	200.1	198.3	190.8	201.0	200.7	200.9	192.7
5	Temp. fire room	96.0	94.7	98.2	.....	113.1	114.9	115.3	94.8
6	Temp. uptake gases	410.3	416.7	442.1	.....	549.5	467.3	448.9	476.5
7	Temp. at "Y," main steam line	484.8	475.5	479.4	.....	477.7	470.3	467.7	480.6
8	Temp. feed water	224.9	225.2	223.9	.....	205.7	213.6	215.9	213.0
9	Superheat—main steam—degs. F.	97.1	87.6	92.2	.....	89.4	82.1	79.4	95.6
10	Air pressure—fire room, in water	Natural	Natural	Natural	.....	1.74	0.34	0.087	Natural
11	Flue gas analysis $\|CO_2$	9.4	10.0	10.6	.....	13.6	12.6	13.1	12.7
12	Third pass—Orsat % $\|O$	5.0	8.2	7.0	.....	3.7	3.5	3.2	3.5
13	Smoke, by Ringelman scale	.5	.5	.5	.....	.25	.25	.25	.5
14	Water evaporated, all purposes	23,970	26,680	30,842	.....	88,279	53,646	47,716	42,972
15	Water evaporated, to main steam	8,260	10,620	14,622	29,132	60,559	33,196	29,166	23,502
16	Water evaporated, to auxiliaries	15,710	16,060	16,220	.....	27,720	20,450	18,550	19,470
17	Factor evaporation, steam to main engine, based on (4), (7), (8)	1.095	1.09	1.094	.....	1.113	1.098	1.096	1.106
18	Equivalent evaporation, steam to main engine (15) × (17)	9,044.7	11,575.8	15,996.5	.....	67,402.2	36,449.0	31,965.9	25,993.2
19	B. t. u's. absorbed in boiler steam to main engine (18) × (970.4)	8,776,977	11,233,157	15,523,004	.....	65,407,095	35,564,190	31,020,109	25,324,801
20	Percent moisture aux. steam	.10	.08	.14	.....	.41	.34	.52	.34
21	Water in steam to auxs. (16) × (20)	15.7	12.9	22.7	.....	113.7	69.6	106.5	64.2
22	Actual steam to auxs. (16) — (21)	15,694.3	16,047.1	16,197.3	.....	27,606.3	20,389.4	18,443.5	19,405.8
23	Factor evap'n steam to auxs. (4), (8)	1.035	1.035	1.034	.....	1.051	1.042	1.038	1.042
24	Equiv. evap'n steam to auxs. (22) × (23)	16,243.6	16,608.7	16,748.0	.....	29,015.2	21,245.8	19,144.4	20,220.8
25	B. t. u's. absorbed in boiler steam to auxiliaries (24) × (970.4)	15,762,789	16,117,082	16,252,259	.....	28,156,350	20,616,924	18,567,726	19,622,265
26	B. t. u's. in water in steam to auxiliaries (above feed temp.)	2,633	2,156	3,825	.....	25,770	12,530	18,940	11,380
27	B. t. u's. absorbed steam and water in boilers (19) + (25) + (26)	24,542,399	27,352,395	31,779,088	.....	93,589,215	56,193,644	49,606,775	44,958,446
28	Fuel oil used, pounds	1,663	1,830	2,184	.....	6,344	3,836	3,167	3,097
29	B. t. u's. fired in oil (18,900 b. t. u./lb.)	31,430,700	34,587,000	41,277,600	.....	119,901,600	72,500,400	59,856,300	58,552,200
30	Boiler and furnace efficiency	78.10	79.10	77.00	.....	78.06	77.50	82.88	76.78
31	Number burners per boiler	6	6	6	8	8	8	8	8
32	Sprayer plates	55-20	55-20	55-20	47-20	47-20	52-20	55-20	55-20
33	Oil pressure at burners	89.6	104.4	126.1	.....	157.1	126.5	197.0	200.3
34	Oil temperature at burners	95.3	89.2	86.6	.....	88.3	90.5	92.2	110.4
35	Actual evaporation per lb. oil	14.42	14.58	14.12	.....	13.92	13.99	15.07	13.88
36	Lbs. oil per S. H. P. per hour.—A. P.	6.12	3.87	2.5	.....	1.195	1.425	1.693	1.535
37	Lbs. oil per cu. ft. furnace vol.	1.285	1.414	1.688	.....	4.903	2.965	2.448	2,394
38	Lbs. oil per sq. ft. heating surface	.143	.158	.188	.....	.547	.331	.273	.267

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TABLE 3—ENGINE DATA—U. S. C. G. C. *MODOC*—AUGUST, 1923

		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
1	Run	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
2	Date	Aug. 20, '23	Aug. 20, '23	Aug. 20, '23	Aug. 21, '23	Aug. 21, '23	Aug. 21, '23	Aug. 21, '23	Aug. 22, '23
3	Duration	9:45 A. M. 11:45 A. M.	1:15 P. M. 3:15 P. M.	4:00 P. M. 6:00 P. M.	7:45 A. M. 8:45 A. M.	10:00 A. M. 12:00 N.	1:15 P. M. 3:15 P. M.	4:15 P. M. 6:15 P. M.	10:00 A. M. 12:00 N.
4	R.P.M.	47.7	59.2	71.9	127.1	128.7	102.9	90.96	95.6
5	Speed-knots	6.36	7.9	9.57	16.0	16.15	13.38	11.98	12.5
6	S.H.P.	134.9	235.9	437.4	.....	2,656.0	1,345.0	937.4	1,008.0
7	K.W., main generator	111.79	190.6	344.2	2,035	2,053.2	1,040.6	730.6	783.8
8	Water measured, Tanks Nos. 1 and 2	22,540	25,150	30,255	28,835	87,580	53,135	47,325	41,905
9	Correction to original level Nos. 1 and 2	+900	+990	+735	+370	+400	+200	+590	+1,535
10	Net water (8) + (9)	23,440	26,140	30,990	29,205	87,980	53,335	47,915	43,440
11	Water measured, Tank No. 3	950	250	20	.....	940	510	0	0
12	Result (10) + (11)	24,390	26,390	31,010	.....	88,920	53,845	47,915	43,440
13	Correction, filter tank to original level	—330	+400	—30	.....	0	0	0	0
14	Result (12) + (13)	24,060	26,790	30,980	.....	88,920	53,845	47,915	43,440
15	Correction, boilers to original levels	0	0	0	.....	0	0	0	—380
16	Result (14) + (15)	24,060	26,790	30,980	.....	88,920	53,845	47,915	43,060
17	Correction factor to calibration temp.	.99623	.99585	.99555	.99750	.99280	.99630	.99585	.99790
18	Total water evaporated (16) × (17)	23,970	26,680	30,842	29,132	88,279	53,646	47,716	42,972
19	Water evaporated, lbs. per hour	11,985	13,340	15,421		44,240	26,823	23,858	21,486
20	Total water measured by meter No. 1	25,502	24,885	31,243		88,990	54,984	46,703	45,945
21	Total water measured by meter No. 2	22,792	24,926	30,474		88,009	55,097	45,922	44,418
22	Steam, auxiliary, lbs. per hour	7,855	8,030	8,110	Auxiliaries Exhausting to Atmosphere	13,860	10,225	9,275	9,735
23	Steam, main engine, lbs. per hour	3,180	4,300	6,759		29,420	16,053	14,098	10,984
24	Leakage, etc. (119) — [(22) + (23)]	950	1,010	552		860	545	485	767
25	Steam per S.H.P. per hour, A.P.	81.8	52.27	34.00		16.29	19.54	24.94	20.56
26	Steam per S.H.P. per hour, M.E.	23.57	18.23	15.45		11.08	11.94	15.04	10.90
27	Aux. exh. cond. feed heater, lbs. per hr.	1,870	2,020	2,280		5,160	3,450	2,830	3,030
28	Aux. exh. to main turbine, lbs. per hr.	5,985	6,010	5,830		8,700	6,775	6,445	6,705
29	Back pressure, aux. exhaust, gage	8.5	8.5	8.8		8.8	8.3	8.5	8.5
30	Steam pressure, bowl	18.0	31.5	51.7	176.0	175.4	139.6	107.2	99.9
31	Vacuum Stbd. side turbine exh. noz.	2.32	2.21	1.99	1.82	2.23	1.70	1.76	1.49
32	Absolute Port side turbine exh. noz.	2.24	2.18	1.92	1.72	2.12	1.67	1.71	1.47
33	Inches Condenser—Top	2.42	2.52	2.15	1.96	2.45	2.27	2.42	1.61
34	of Air pump—wet suction	2.46	2.51	2.14	1.91	2.23	2.27	2.42	1.59
35	Mercury Air pump—dry suction	2.45	2.48	2.12	1.85	2.00	2.26	2.49	1.60
36	Displacement at beginning—tons	1,658.5	....	....	1,648.4	....	....	....	1,620.4
37	Displacement at end—tons	.....	....	1,648.4	.....	....	....	1,620.4	1,598.3
38	Draft, mean, at beginning	14'-1¼"	....	....	14'-0¾"	....	....	....	13'-10½"
39	Draft, mean, at end	.....	....	14'-0¾"	.....	....	....	13'-10½"	13'-8¾"

Speed Indicators.—Tachometers, revolution counters, etc., for each individual unit.

Gages.—A pressure gage on the liquid end of every pump. All gages were calibrated immediately before the trials.

Thermometers.—At every place where it was desirable to know the temperature accurate thermometers were installed.

Steam Calorimeters.—Three throttling calorimeters were installed in the steam pipes in the fireroom, two for main steam and one for auxiliary steam. These were so noisy as to interfere seriously with work in the fireroom. When it had been demonstrated that the quality of steam remained practically constant under settled conditions, continuous use of the calorimeters was abandoned. Immediately following a two-hour run the calorimeters were turned on and readings taken before operating conditions were changed. Calorimeters were calibrated twice during the trials. (See Fig. 11).

Draft Gage.—A differential gage.

Time Signals.—Electric gongs of the fire alarm type installed in fireroom and engineroom and on deck. Signals were a one-second ring for stand-by, one minute before time, and a one-second ring at time.

Water Meters.—Two 3-inch water meters, loaned by the Bureau of Engineering, Navy Department, were installed in series to measure the outflow from the water measuring tanks. The meters were calibrated before and after the tests.

Pyrometers.—Three steam pyrometers and one stack pyrometer on board the ship were left in place. Four base metal thermo-couples were installed in uptakes.

Gas Analysis.—The Orsat apparatus was employed constantly, and the furnace conditions were regulated as indicated.

Absolute Pressure Gage.—Two fitted (port and starboard) to exhaust nozzle of main turbine, with sampling tubes extending entirely across nozzle. One fitted with connections to top and bottom of main condenser and to suction end of each cylinder of air pump. Readings of pressures at bottom of condenser were vitiated by water which could not be removed from the tubing.

RECORDING OF DATA

All rough records were kept in bound books with pages properly ruled. Duplicate books were used for alternate runs.

TABLE 4.—U. S. C. G. C. *MODOC*—DISTRIBUTION OF STEAM UTILIZED—AUGUST, 1923.

Run No.	1		2		3		5		6		7		8	
R. P. M. main motor	47.7		59.2		71.9		128.7		102.9		90.96		95.6	
	R. P. M.	Steam Lbs.-Hr.	R. P. M.	Steam Lbs.-Hr.	R. P. M.	Steam Lbs.-Hr.	R.P.M.	Steam Lbs.-Hr.	R.P.M.	Steam Lbs.-Hr.	R.P.M.	Steam Lbs.-Hr.	R.P.M.	Steam Lbs.-Hr.
Feed pump	4.63	345	5.13	355	6.04	385	16.48	1,000	10.67	575	8.9	490	8.68	475
Fuel oil pump	10.95	355	11.9	380	13.35	415	22.54	560	16.84	455	17.55	525	17.26	595
Fuel oil heater	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	120
Forced draft blower	....	.....	....	.....	....	.....	1,343.9	1,540	731.1	665	528.0	510	....	120
Total boiler group	....	700	....	735	....	800	....	3,100	....	1,695	....	1,525	....	1,190
Circulator	633.3	1,350	637.8	1,375	633.9	1,350	11.40	2,960	796.6	1,740	608.9	1,110	636.1	1,370
Air pump	10.51	490	11.94	575	11.84	570	18	975	16.9	895	11.53	550	14.49	730
Total vacuum group	....	1,840	....	1,950	....	1,920	....	3,935	....	2,635	....	1,660	....	2,100
Lighting, etc.	....	1,310	....	1,520	....	1,520	....	1,440	....	1,470	....	1,490	....	1,460
Sanitary pump	13.43	450	14.53	475	16.76	525	19.14	580	16.13	510	15.74	500	25.12	710
Bilge pump	43.12	205	45.0	210	40.42	190	42.25	200	48.6	230	57.63	270	69.38	320
Transfer pump	6.57	130	7.58	140	8.88	145	22.9	245	14.76	185	12.45	170	11.78	165
Steam kettles	....	80	....	.....	....	100	....	.....	....	.....	....	.....	....	100
Total miscellaneous	....	2,175	....	2,345	....	2,380	....	2,565	....	2,395	....	2,430	....	2,755
Total boiler group	....	700	....	735	....	800	....	3,100	....	1,695	....	1,525	....	1,190
Total vacuum group	....	1,840	....	1,950	....	1,920	....	3,935	....	2,635	....	1,660	....	2,100
Total miscellaneous	....	2,175	....	2,345	....	2,380	....	2,565	....	2,395	....	2,430	....	2,755
Total auxiliaries	....	4,715	....	5,030	....	5,100	....	9,600	....	6,725	....	5,615	....	6,045
Excitation main machinery	....	3,140	....	3,000	....	3,010	....	4,260	....	3,500	....	3,660	....	3,690
Total auxiliary steam	....	7,855	....	8,030	....	8,110	....	13,860	....	10,225	....	9,275	....	9,735
Main turbine only	....	3,180	....	4,300	....	6,758	....	29,420	....	16,053	....	14,098	....	10,983
Total steam utilized	....	11,035	....	12,330	....	14,868	....	43,280	....	26,278	....	23,373	....	20,718

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Table 5

U.S.C.G.C. MODOC—Alternating-Current Data—Underway Trials.

RUN NO.				1	2	3	4	5	6	7	8
REVOLUTIONS PER MINUTE				47.7	59.2	71.9	127.1	128.7	102.9	90.96	95.6
GENERATOR OUTPUT	PHASE 1-2	AMPERES		132.3	161.0	216.8	581.0	580.0	403.8	297.4	302.4
		VOLTS		695.0	854.9	1045.0	1971.0	2073.0	1502.0	1428.0	1504.0
		K.W.		22.09	54.6	122.1	978.0	945.7	509.2	361.1	387.6
	PHASE 2-3	AMPERES		132.4	161.0	216.8	582.0	581.0	399.8	292.4	301.4
		VOLTS		689.7	855.2	1006.0	1980.0	2086.0	1493.0	1425.0	1499.0
		K.W.		89.70	136.0	222.1	1057.0	1107.5	531.4	369.5	336.2
	POWER FACTOR			0.63	0.80	0.89	0.933	0.93	1.00	1.00	1.00
	K.W. TOTAL			111.79	190.6	344.2	2035.0	2053.2	1040.6	730.6	783.8
MOTOR	MOTOR LOSS, K.W.			11.20	13.80	16.30	64.80	69.60	35.60	30.10	30.30
	THRUST BEARING LOSS, K.W.				0.80	1.00	1.70	1.60	1.40	1.20	1.20
	MOTOR OUTPUT, K.W.			100.6	176.0	326.9	1969	1982.0	1003.6	699.3	752.3
	MOTOR OUTPUT, I.H.P.			134.9	235.9	437.4	2639.0	2656.0	1345.0	937.4	1008.0
TEMPERATURES IN DEGREES C.	GENERATOR	RESISTANCE TEMPERATURE DETECTORS IN ARMATURE. SEE DRAWING NO. 14.	1	41.0	42.4	42.8	59.5	61.7	48.0	43.0	43.2
			2	41.0	42.3	42.5	57.6	60.2	47.5	42.5	43.0
			3	40.0	41.8	42.4	59.5	61.9	47.5	42.8	42.9
			4	41.0	42.4	42.8	59.5	61.5	47.5	42.8	43.1
			5	42.2	43.1	43.5	54.8	59.0	46.5	43.0	44.0
			6	40.5	41.9	42.2	59.6	61.2	47.0	42.0	42.5
		FIELD		79.0	78.0	79.0	91.0	94.0	71.0	70.5	70.0
		AIR	IN	35.0	33.7	33.9	31.0	34.2	31.2	30.5	31.9
			OUT	38.0	38.0	38.6	42.5	47.0	39.5	39.0	38.4
	MOTOR	RESISTANCE TEMPERATURE DETECTORS IN ARMATURE. SEE DRAWING NO. 16	1	43.4	47.5	49.0	35.0	101.2	69.8	61.2	60.1
			2	43.0	47.8	50.5	103.5	111.8	76.7	65.9	63.4
			3	45.1	48.2	50.0	84.5	92.2	67.3	60.2	60.5
			4	46.6	49.0	52.0	94.5	103.8	70.8	63.0	62.5
		FIELD		75.0	80.0	79.0	111.0	127.5	105.0	112.0	114.5
		AIR	IN	32.7	31.9	32.1	32.0	34.6	31.2	30.2	28.4
			OUT	35.0	36.0	36.8	44.0	52.0	42.0	39.5	38.3

Table 6

U.S.C.G.C. MODOC—Direct Current Data—Underway Trials

RUN NO.		1	2	3	4	5	6	7	8
REVOLUTION PER MINUTE		47.7	59.2	71.9	127.1	128.7	102.9	90.96	95.6
MAIN GENERATOR FIELD	AMPERES	92.7	91.2	91.2	121.3	131.0	95.4	95.4	95.8
	VOLTS AT EXCITER	116.7	116.5	116.4	124.1	125.3	120.2	120.3	121.5
	K.W. INCL. RHEOSTAT LOSS	10.8	10.6	10.6	15.1	16.4	11.5	11.5	11.6
	VOLTS ACROSS SLIP RINGS	68.3	66.9	67.2	92.9	101.0	68.7	68.4	68.5
	RESISTANCE OF FIELD, OHMS	0.737	0.734	0.737	0.765	0.772	0.720	0.717	0.715
MAIN MOTOR FIELD	AMPERES	161.3	158.6	158.3	245.2	257.8	211.0	228.0	228.0
	VOLTS AT EXCITER	117.1	116.0	116.0	125.5	126.0	119.5	121.0	122.3
	K.W. INCL. RHEOSTAT LOSSES	18.9	18.3	18.4	30.8	32.5	25.2	27.6	28.0
	VOLTS ACROSS SLIP RINGS	63.8	63.6	63.5	108.2	119.3	91.6	101.0	101.6
	RESISTANCE OF FIELD, OHMS	0.396	0.402	0.401	0.442	0.463	0.434	0.443	0.446
VENTILATION MOTOR	AMPERES	33.4	33.0	32.8	33.7	33.6	33.5	33.6	33.1
	VOLTS	114.5	113.9	113.9	125.4	124.1	117.0	118.2	119.0
	K.W.	3.82	3.76	3.74	4.23	4.16	3.92	3.97	3.94
STEERING GEAR	K.W. BY WATTHOUR METER	2.46	2.81	3.31	3.47	3.52	2.93	2.80	3.06
EXCITER OUTPUT	AMPERES, POSITIVE	189.6	186.4	188.8	281.2	288.0	237.2	258.0	259.5
	AMPERES, NEGATIVE	188.8	187.6	186.1	217.1	231.8	185.2	199.0	192.5
	VOLTS, POSITIVE TO NEUTRAL	117.0	116.0	116.0	125.5	126.0	119.5	121.0	122.3
	VOLTS, NEGATIVE TO NEUTRAL	116.7	116.5	116.4	124.1	125.3	120.2	120.3	121.5
	K.W. TOTAL	42.2	43.5	43.6	62.2	65.3	51.8	55.2	55.2
SUMMARY	EXCITATION, GENERATOR, K.W.	10.8	10.6	10.6	15.1	16.4	11.5	11.5	11.6
	EXCITATION, MOTOR, K.W.	18.9	18.3	18.4	30.8	32.5	25.2	27.6	28.0
	EXCITATION, TOTAL, K.W.	29.7	28.9	29.0	45.9	48.9	36.7	39.1	39.6
	VENTILATION MOTOR, K.W.	3.82	3.76	3.74	4.23	4.16	3.92	3.97	3.94
	STEERING GEAR, K.W.	2.46	2.81	3.31	3.47	3.52	2.93	2.80	3.06
	OTHER PURPOSES, K.W.	6.22	8.03	7.55	8.60	8.72	8.26	9.39	8.60

Immediately after each test, all observed data were assembled on prepared sheets and the results worked out as rapidly as possible, in order that readings of a questionable nature might be verified or rejected immediately by another test. The expression "revolutions per minute" is employed throughout, regardless of whether machine rotates or not.

Checks

The sum of the readings of the two steam flow meters should equal the steam consumption of all auxiliaries in use as shown by their respective curves. The total of auxiliary steam consumption plus the flow through main turbine nozzles should equal the total condensate. The readings of each of the water meters should equal the volume of water as shown by the measuring tanks. Readings of No. 1 steam-flow meter should show the steam consumption of the exciter and the forced draft blower, those being the only under-way auxiliaries taking steam through the starboard branch of the auxiliary steam line. Readings of No. 2 steam-flow meter should show the steam consumption of all other auxiliaries.

Testing Auxiliaries in Port

Each piece of apparatus was tested singly. In general the test consisted of a series of five runs of 6 minutes each, representing the possible range of operation of the unit. All other apparatus was stopped, steam was condensed in the auxiliary condenser, the condensate flowed from the condenser by gravity, was caught in a receptacle, weighed and dumped into the bilge. During these tests the auxiliary circulating pump, feed, fuel, sanitary and fresh-water pumps were exhausted to the atmosphere.

A calibration curve was drawn for each unit.

Steam radiators, bath heaters, etc., were shut off during under-way trials. When steam kettles were required, condensate was accounted for. Condensate from feed and fuel heaters, etc., ordinarily drains to the filter tank. Pipes were temporarily altered so as to drain into the feed water transfer tank, with arrangements for drawing off and measuring the condensate from any desired drain.

Determining Condensation in Steam Lines

This test was made during two hours of one day while the ship was in dry dock. All apparatus was shut off and standard steam pressures were maintained, using the hand fuel oil pump as necessary. All low points in auxiliary steam piping were drained to traps continuously, and weights were recorded. The rate of condensation thus determined was assumed to be constant throughout the under-way trials.

Operation of Main Feed Pump

Worthington, simplex, 10 inches by 6 inches by 24 inches, No. B 250748. (Identical test was run on auxiliary feed pump, Worthington, simplex, 10 inches by 6 inches by 24 inches, No. B 250638.)

The pump was operated to feed the starboard boiler, which was cold. The bottom blow on the boiler was used as necessary to maintain 200 pounds pressure. Feed was taken from measuring tanks on deck and the rate of discharge was regulated to obtain as nearly constant volume as possible. Steam end and water end of pump were indicated simultaneously twice during each 6-minute run. Results of tests of main and auxiliary feed pumps are shown in Fig. 1 and Table 1.

Operation of Fuel Oil Pumps

Worthington, duplex, 5¼ inches by 3½ inches by 5 inches, Nos. B 251263 and B 250968. (Each pump separately.)

The steam consumed by a reciprocating plunger pump is affected by piston speed and by discharge pressure. If there are no check valves to lift in the discharge line (as is the case with a fuel oil pump), and discharge pressure is em-

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ployed only to overcome the resistance of a restricted outlet (burner orifices, for a fuel oil pump), service conditions can be duplicated by discharging into bunker tanks through a restricted valve in the oil discharge line. The work done in imparting motion to the oil and in overcoming frictional resistance is the same under both conditions.

Under service conditions speed and pressure do not vary together, and it becomes necessary to cover the entire range of speeds at different pressures, so as to calibrate for two unrelated variables.

For each pump separately, tests in port consisted of three series of three runs each; each run of 6 minutes' duration. The three series represented conditions respectively for low, medium, and high oil pressures.

Burners were operated as necessary at pump test pressure, which was kept constant during each run.

Results of these tests are shown in Figs. 2 and 3, and Table 1.

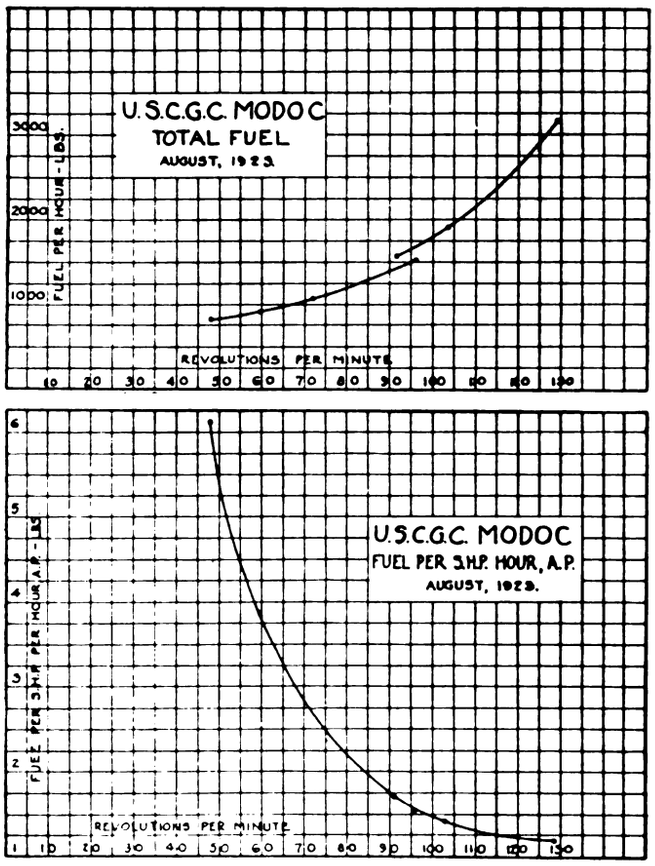
Operation of Main Air Pump

Worthington, twinplex, wet and dry, 12 inches by 22 inches by 18 inches, No. B 251049.

An effort was made to determine the effects on steam consumption of piston speed, suction pressure, and weight of water handled. Speed is varied at will under service conditions; suction pressure varies with a number of factors, not all being under control; and weight of water varies with operating conditions of machinery. On this test, therefore, all three were varied to ascertain their effects on steam consumption.

Means were provided for introducing water from measuring tanks on deck into the main condenser at a constant rate to ascertain the effect of weight of water pumped for different conditions, corresponding to about 8 knots, 12 knots and 16 knots. The effects of varying water and vacuum were found to be smaller than the limits of accuracy of the test.

Results of this test are shown in Fig. 1 and Table 1.



Figs. 17 and 18

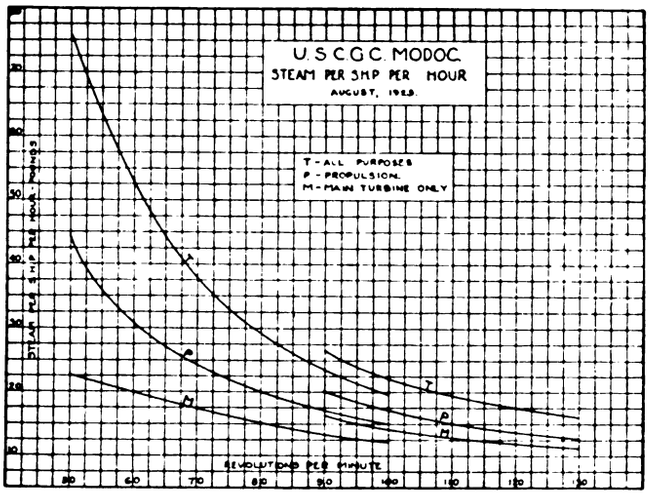


Fig. 19.—Steam per S. H. P. per Hour

Results of this test are shown in Fig. 1 and Table 1.

Operation of Forced Draft Blower

Terry turbine No. 7609; Keith fan, 22½ inch, No. 117.

Tests in port consisted of three series of five runs each, each run being of 6 minutes' duration. The three series represented different register openings and the runs of each series were at air pressures varying from 0.75 inch to 2.1 inch fireroom pressure. Blower speed was regulated from the fireroom. Variations of pressure and volume of air did not affect steam consumption sufficiently to be observed in these trials.

Results of this test are shown in Fig. 5 and Table 1.

Operation of Fire Pump

Terry turbine No. 7437; Worthington pump, type BS, 14-inch, No. 663680.

This pump is installed in such close quarters that the revolutions could not be taken with any instruments on board. Steam pressure was maintained at 125 pounds, which accounts for the drop in discharge pressure at capacities higher than the designed capacity; by increasing the steam pressure a satisfactory discharge pressure can be maintained on six lines of hose. On this test seven 6-minute runs were made with different numbers of lines of hose in use, from one to seven lines, and a run with the pump discharging circulating water through the main condenser. Results of this test are shown in Fig. 6 and Table 1.

Operation of Bilge Pump (Worthington, simplex, 6½ inches by 8 inches by 8 inches, No. B 251130).

Sanitary Pump (Worthington, simplex, 8 inches by 8 inches by 12 inches, No. B 250614).

Oil Cooler Circulating Pump (Worthington, simplex, 7 inches by 8 inches by 12 inches, No. B 251652, used during the trials as a feed water transfer pump).

Lubricating Oil Pump (Worthington, simplex, 6½ inches by 7 inches by 8 inches, No. B 246948).

Each pump was operated separately under its normal operating conditions, as described in detail elsewhere for other pumps.

A series of five runs of 6 minutes each was made on each, and covering the entire range of speeds. Results of these tests are shown in Fig. 1 and Table 1.

Operation of 75 K.W., D. C. Generator

General Electric direct current generator No. 1157804, type R-C 17, compound wound, 125/250 volts, 1,200 revolutions per minute three-wire; connected through Poole turbo

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gear No. 680, 200 horsepower, type C-10-60-3, ratio 3600/1200, to General Electric turbine No. 27212, 75 kilowatts, 3,600 revolutions per minute, 200 pounds steam pressure, non-condensing. Designated on board ship as Exciter No. 1.

General Electric direct current generator No. 1157805; turbo gear No. 679; turbine No. 27211. Rating same as unit above. Designated on board as Exciter No. 2.

These units are used for supplying excitation to the main generator and main motor, and lighting and power for motors and electrical auxiliary devices in various parts of the ship

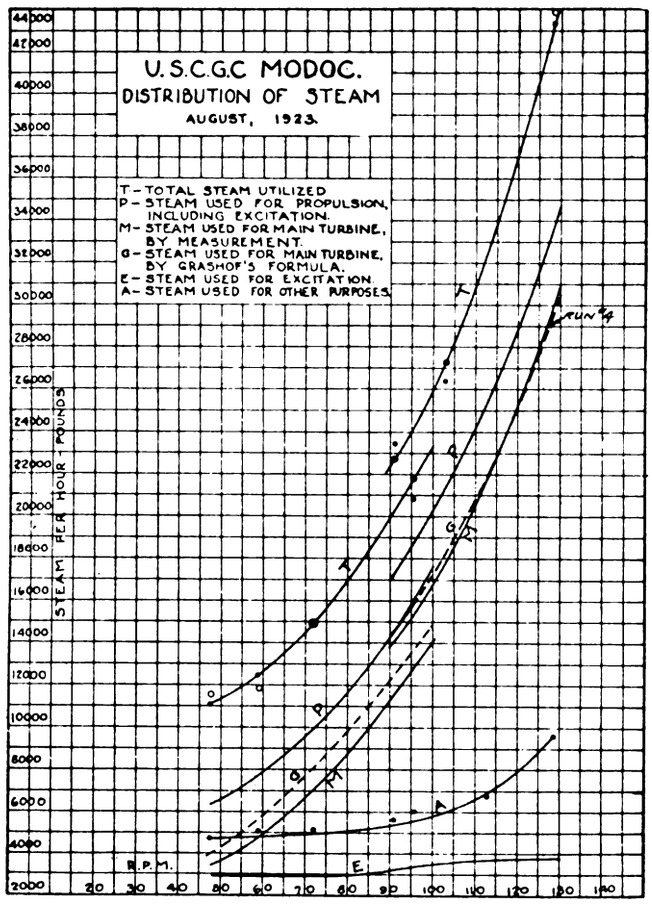
U.S.C.G.C MODOC.
DISTRIBUTION OF STEAM
AUGUST, 1923.
T - TOTAL STEAM UTILIZED
P - STEAM USED FOR PROPULSION, INCLUDING EXCITATION.
M - STEAM USED FOR MAIN TURBINE, BY MEASUREMENT.
G - STEAM USED FOR MAIN TURBINE, BY GRASHOF'S FORMULA.
E - STEAM USED FOR EXCITATION.
A - STEAM USED FOR OTHER PURPOSES.
STEAM PER HOUR - POUNDS
R.P.M.

Fig. 20.—Distribution of Steam

while under way. Only one unit is used at one time, the other being a spare.

Water rate tests were made on each unit. Six minute runs were made from no load to full load. The kilowatt output was measured by ammeters in the positive and negative lines and voltmeters connected from each of these lines to the neutral. The first four tests on Exciter No. 1 were made using all the lighting and power load that was available in port. This gave only about 60 percent load. For the other tests up to full load and all the tests on Exciter No. 2 a water barrel load was used, connected across the 250 volt lines. This gave practically a balanced load. (See tables for summary of electrical output during these tests.)

During the under-way trials Exciter No. 2 was used. Readings were taken every 15 minutes. A summary of these tests is shown in Table 6, and the results are graphically shown in Figs. 7, 8 and 9.

Operation of Boilers

There are two marine type Babcock & Wilcox boilers, each having 2,900 square feet of heating surface and 290 square feet of superheating surface. They are fitted with Babcock & Wilcox oil burners, operating under either natural or forced draft.

On the under-way trials the boilers were treated as if they alone were undergoing test. The quantity and quality of steam were determined as above; atmospheric conditions, furnace conditions, quantity and thermal value of oil, etc., were determined as on a regular boiler test, so that furnace efficiency, boiler efficiency, and over-all efficiency might be arrived at.

Tests were made at eight speeds, of which seven included

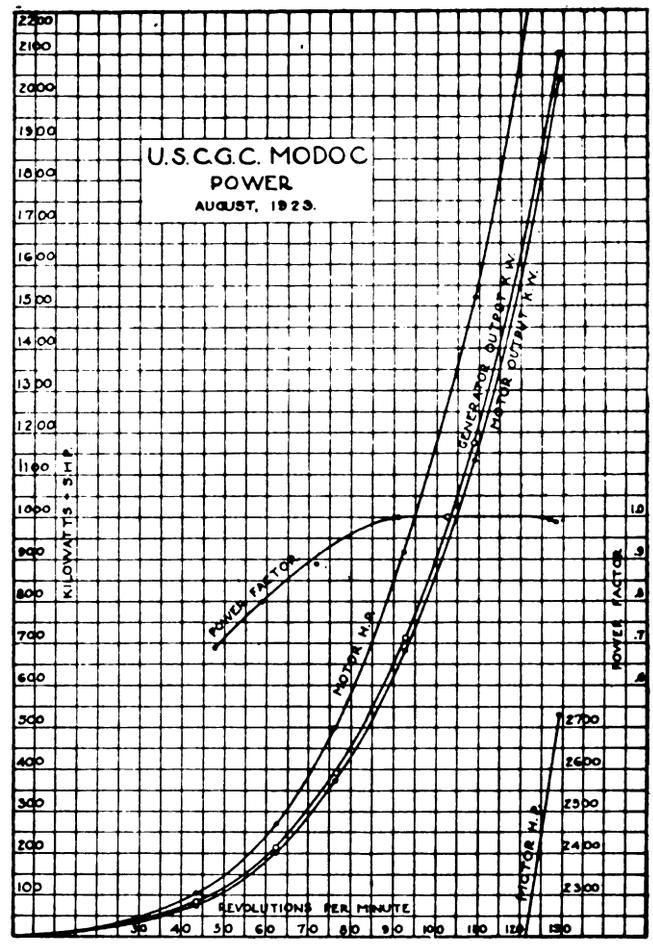

Fig. 21.—Power Curves

tests to determine boiler and furnace efficiency. (For speed conditions see "Operation of Propelling Machinery.") Methods of determining quantities of fuel oil and water are detailed elsewhere.

The following were maintained as nearly uniform as possible: Water level in boilers; water level in feed tank; steam pressure 200 pounds.

The water tender constantly made up feed from the measuring tanks on deck.

All burners were examined between each two runs and cleaned as necessary.

Boiler tubes were steam-lanced once each day.

Results of boiler tests are shown in Figs. 17 and 18, and Table 2.

Operation of Feed Water Heater

Griscom-Russell Company, Reilly, type D, size 12. The rate of condensation was determined on four runs and the results are shown in Item 27, Table 4.

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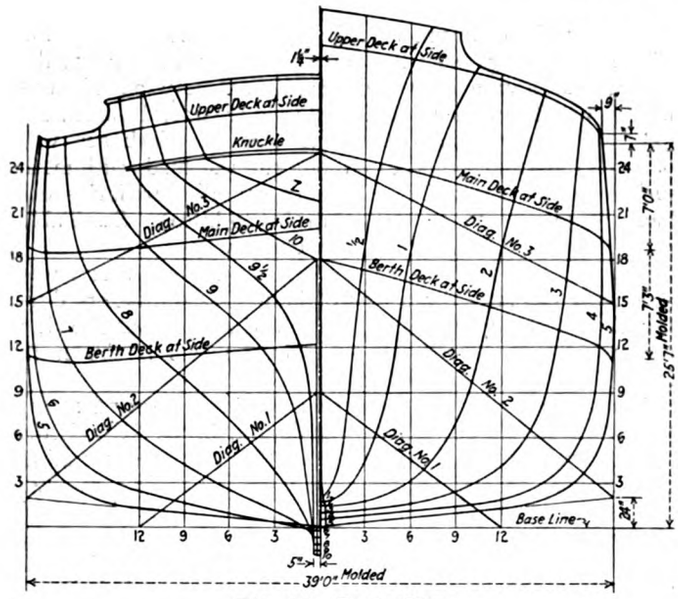

Fig. 22.—Body Plan

Length overall, 240 feet; length on waterline, 220 feet; beam, molded, 39 feet; mean draft to trial waterline, 14 feet 3 inches; displacement, tons, 1,680; distance between stations, 22 feet.

Characteristics of Fuel

Throughout the under-way trials, fuel oil samples were drawn from the pump discharge line, a few ounces at a time, the total sample collected amounting to about three quarts. Analyses of the oil thus collected resulted as follows:

	Flash °F.	Water %	Sed. %	Visc.	Sp. G. at 60° F.	B.T.U.
Test No. 1....	194	nil	nil	12 sec.	.9300	18910
Test No. 2....	194	nil	nil	12 sec.	.9289	18920
Test No. 3....	194	nil	nil	12 sec.	.9292	18890

Operation of Fuel Oil Heaters

Two, Griscom-Russell Company, Reilly, multicoil, size No. 6.

Oil was not heated on these trials, except during run No. 8, because a proper atomization could be obtained with oil at bunker temperatures.

Operation of Propelling Machinery

There are two units in the propulsion machinery, a steam turbo-generator and a motor. These machines, with their controls and other necessary appurtenances, were designed and built by the General Electric Company. The turbine is an eight-stage Curtis machine, running at 3,000 revolutions per minute, taking steam at 200 pounds (gage) pressure per square inch and 50 degrees to 75 degrees F. superheat. It is direct connected to a two-pole, three-phase, alternating-current generator of the revolving field type, designed to deliver 2,040 kilowatts at 2,300 volts and unity power factor. The generator supplies power to the main motor, which is of the synchronous type with a squirrel-cage winding on the revolving field. The motor has 46 poles and is designed to deliver 2,600 shaft horsepower at 130 revolutions per minute.

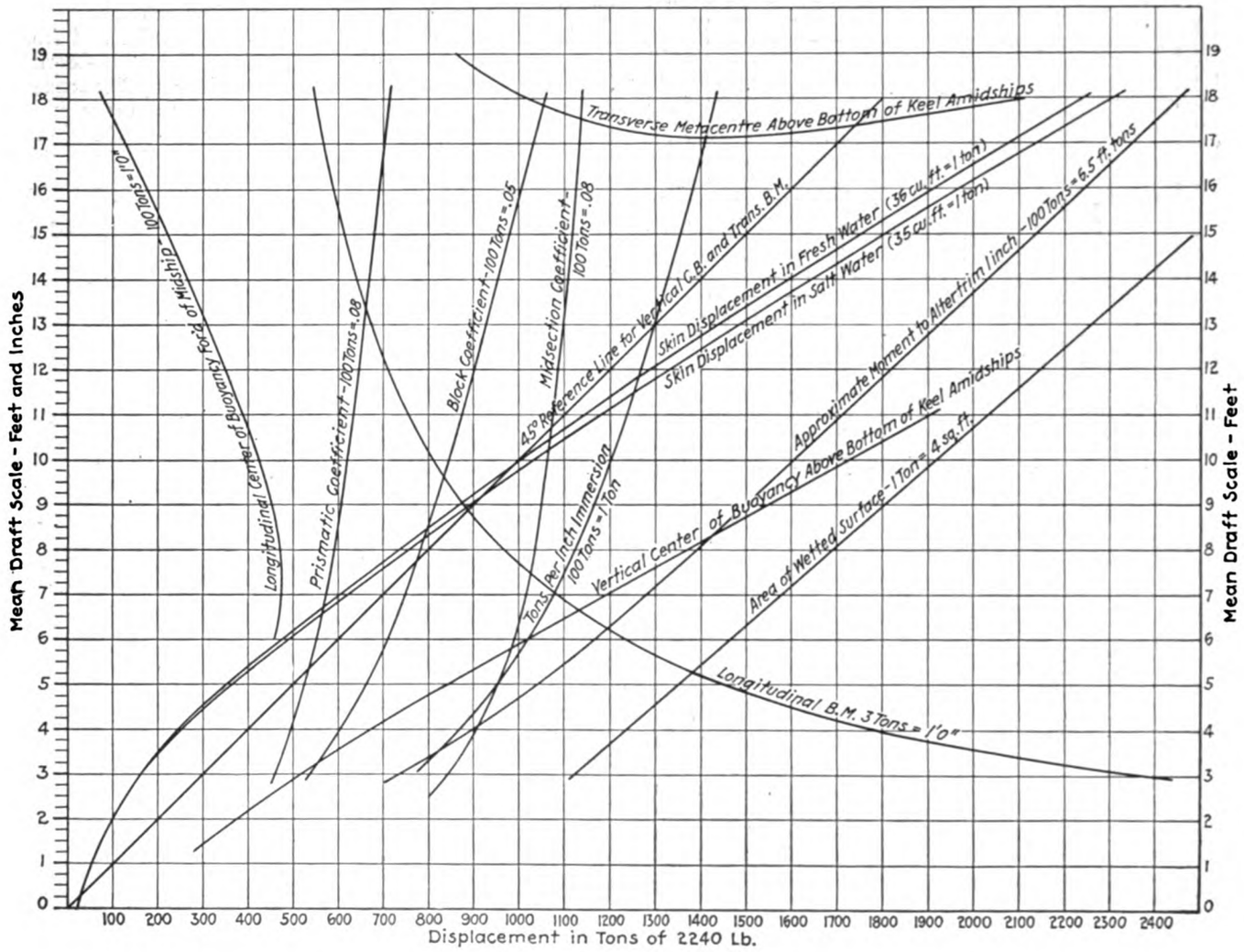
Mean Draft Scale - Feet and Inches
Mean Draft Scale - Feet
Displacement in Tons of 2240 Lb.
Transverse Metacentre Above Bottom of Keel Amidships
100 Tons = 1'0"
Longitudinal Center of Buoyancy Forward of Midship
Prismatic Coefficient - 100 Tons = .08
Block Coefficient - 100 Tons = .05
Midsection Coefficient - 100 Tons = .08
45° Reference Line for Vertical C.B. and Trans. B.M.
Skin Displacement in Fresh Water (36 cu. ft. = 1 ton)
Skin Displacement in Salt Water (35 cu. ft. = 1 ton)
Approximate Moment to Alter Trim 1 inch - 100 Tons = 6.5 ft. tons
Tons Per Inch Immersion - 100 Tons = 1 Ton
Vertical Center of Buoyancy Above Bottom of Keel Amidships
Area of Wetted Surface - 1 Ton = 4 sq. ft.
Longitudinal B.M. 3 Tons = 1'0"

Fig. 23.—Displacement and Other Curves

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There is a General Electric thrust bearing on the main shaft. The propeller is a built-up four-bladed bronze wheel, 13 feet in diameter by 14 feet pitch with a helicoidal area of 61.0 square feet.

The main condenser has a cast iron cylindrical shell, 58 inches in diameter by 9 feet long, and has a cooling surface of 3,600 square feet.

During under-way trials, sufficient time was allowed to elapse between test periods for new conditions to be definitely established, which was indicated by constant fuel oil consumption, after which the test proceeded for two hours. Under-way trials were held at speeds of 6, 8 and 10 knots, maximum natural draft speed under both natural and forced draft; 14 knots, and maximum obtainable speed. A one-

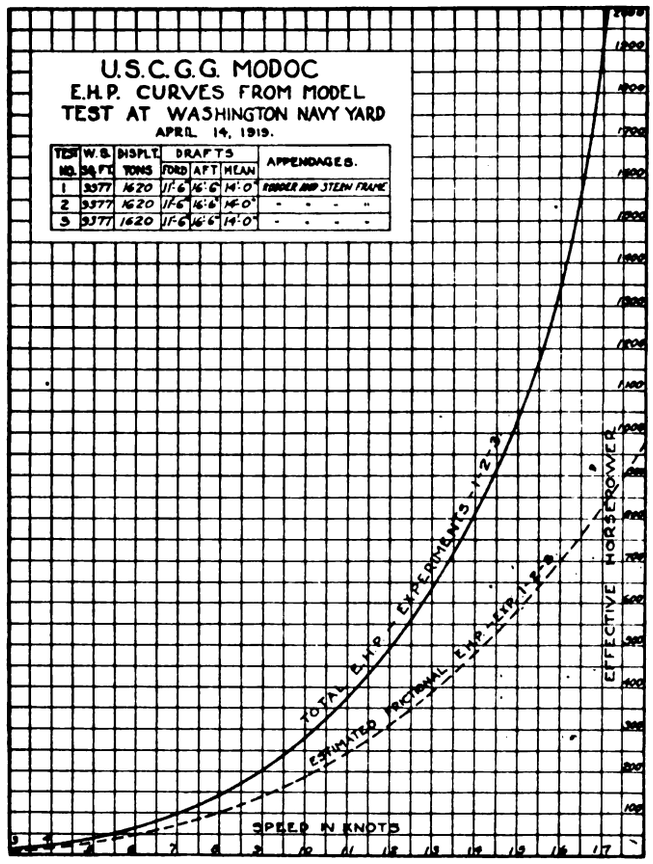
U.S.C.G.G. MODOC
E.H.P. CURVES FROM MODEL
TEST AT WASHINGTON NAVY YARD
APRIL 14, 1919.
TEST NO. | W.S. 34 FT. | DISPLT. TONS | DRAFTS FORD | AFT | MEAN | APPENDAGES.
1 | 9377 | 1620 | 17'-6" | 16'-6" | 14'-0" | RUDDER AND STERN FRAME
2 | 9377 | 1620 | 17'-6" | 16'-6" | 14'-0" | - - - "
3 | 9377 | 1620 | 17'-6" | 16'-6" | 14'-0" | - - - -
TOTAL E.H.P. - EXPERIMENTS AT 14.9
CORRECTED MODEL E.H.P. LESS 15%
EFFECTIVE HORSEPOWER
SPEED IN KNOTS

Fig. 24.—Power Curves from Model Tests

hour full-power run was also made with auxiliaries exhausting to the atmosphere. The speed of the vessel was determined solely by revolutions of the main motor.

All data everywhere are referred to revolutions per minute of propelling motor and every effort was therefore made to hold revolutions per minute constant throughout each run. The revolution indicator served in general for the guidance of the operator, but the revolution counter was read and revolutions per minute calculated every 5 minutes. The operator of the main turbine had no other duties than to regulate speed.

Pressures in main steam line, in turbine bowl, in auxiliary exhaust line and in main turbine exhaust were recorded every fifteen minutes.

Lubricating oil pressures and bearing temperatures of main turbo-generator and main motor were recorded every fifteen minutes.

Temperature steam at "Y" in main steam line was recorded every fifteen minutes. Steam pressure was maintained at 200 pounds (gage).

The auxiliaries in use were those essential to the operation of the ship. Logs were kept of all units in use. From the various calibration curves the steam consumption of auxiliaries was determined. This deducted from total condensate gave the consumption of the main turbine. Each run was of two hours' duration (except that a run was made with main turbine alone exhausting to condenser; all auxiliaries exhausting to atmosphere and all drains to bilge). See Table 3 for detailed data of auxiliaries under way.

The electrical input to the motor (output of generator) was accurately measured by means of indicating wattmeters during all under-way trials. A diagram of connections showing the special test transformers and instruments is shown in Fig. 12.

Excitation to the fields of the main generator and motor was determined by measuring the current in the field circuit and the voltage at the exciter. In this way the excitation includes field rheostat losses. The voltage directly across the slip rings was measured to determine the resistance of the field at various values of current. To make this measurement, a brush on each ring was insulated from its holder. To the pig tails, which were disconnected from the brush holders, were connected the voltmeter leads. In this way the drop across the field was measured without including the voltage drop across the brushes.

During the standardization runs the wattmeters were read as rapidly as possible, the current and voltage being read about every minute.

During the under-way tests the wattmeters were read every minute and the ammeters and voltmeters every two minutes. The field instruments were read every fifteen minutes.

The main motor losses for each test were calculated from electrical data obtained during the test. The thrust-bearing losses were obtained from the A. C. Engineering Department of the General Electric Company. From the motor input were subtracted the motor losses and thrust-bearing losses which gave the power delivered to the shaft. This was then converted to shaft horsepower. A summary of all these values may be found in Table 5.

The generator and motor field data are summarized in Table 6.

Temperatures of Main Turbo Generator and Propulsion Motor

The temperatures of the armatures of these machines were determined by standard resistance temperature detectors in the armature windings, and a portable temperature indicator. Thermometers were placed at the various air intake openings in both units to determine the temperature of the ingoing air. The average of all the thermometers on each machine was used as the value of this temperature. The outgoing air was measured by thermometers in the air exhaust ducts. Readings were taken at about ten-minute intervals during the sea trials.

The temperature of the fields is that determined by rise in resistance method, using as a base the cold resistance as measured in the factory and the hot resistance as shown in Table 5. A check measurement of cold resistance made after the sea trials checked the factory value.

The location of the resistance temperature detectors is shown in Fig. 14.

The location of the thermometers is shown in Figs. 15 and 16.

A summary of the temperature data is shown in Table 5. The values given represent the maximum value determined during a test.

Reversing Trials

There are two methods of killing the ahead motion of the propeller shaft. The first method, which is employed when the ship has considerable headway or when it is necessary to lock the propeller (as in drifting over dredge mooring lines,

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for example), is the dynamic braking method. The principle involved is the electrical absorption of the work done by the water in turning the propeller ahead. The power cables from generator to motor are connected, the generator field is dead, and the direct current field of the motor is fully excited. The motor, under these conditions, is driven by the propeller and produces current which is short-circuited through the generator. When the motor is thus braked to rest, the motor field is thrown off, double excitation is applied to generator field and the motor reverses under the action of the squirrel-cage windings on the rotor. There is an inherent difficulty in this method. If full generator voltage were available for reversal at the instant when dynamic braking ceases, reversing would be immediate. But it requires about two seconds for the field flux in the generator to build up, and during this time the motor, being entirely free, again acquires ahead rotation.

The second method of reversing is to ignore the dynamic braking and use only the induction motor principle for the whole process. In ordinary maneuvering and in reversing from low and moderate speeds, the second method only is used and reversal is practically instantaneous.

Two trials were made to determine the reversing characteristics of the motor using the dynamic braking method. On each trial the vessel was running 16 knots when the signal to reverse was given. Results were as given in trials 1 and 2:

	No. 1	No. 2	No. 3	No. 4
Speed of ship, knots	16	16	16	16
Time to stop motor, secs.	69	40	12	11
Time to rotation astern, secs	70	114	..	..
Time to 80 R. P. M. astern, secs. ..	116	128	70	69
Distance, to dead in water, feet ..	1,450	1,500	1,050	974

Subsequent trials, using the induction motor characteristics only, resulted as shown in trials 3 and 4.

CONCLUSION

This paper is confined to a description of the methods and apparatus employed in making the trials. It is believed that the appended tabulations and curves are sufficiently self-explanatory. It is desired, however, to call attention to two very important checks, which establish the general accuracy of the figures obtained. As already stated, the steam consumption of the main turbine was determined by measuring the total steam consumed and subtracting therefrom the steam consumed for all other purposes. Run No. 4, which measured main steam only, falls exactly on the curve thus obtained (see Fig. 19). Taking the actual turbine bowl pressures, and calculating steam consumption by Grashof's formula, produces the values shown in dotted lines in Fig. 19. The divergence of calculated from actual steam consumption at low powers is due principally to auxiliary exhaust admitted to fifth stage of the turbine. The effect is not noticeable at high powers, where a large part of the auxiliary exhaust was being condensed in the feed heater; it is particularly marked in run No. 8, where the quantity of auxiliary exhaust was greater than usual, and where the otherwise unreasonable steam consumption of 10.9 pounds per horsepower hour was obtained.

The salinity of feed water was measured at frequent intervals, and by this method the leakage of salt water into the condenser was found to be negligible.

All runs were made in practically smooth water, which accounts in a large measure for the accuracy of gage-glass readings on water tanks and oil-measuring tanks. A reduction in displacement of the ship during the progress of the trials did not appreciably change her trim.

SUEZ CANAL BREAKS RECORD.—The net tonnage of vessels passing through the Suez Canal during the first nine months of 1923 amounted to 16,984,000 tons, and exceeded by 1,667,000 tons the total for 1912.

Taylor's New Propeller Curves

By A. J. C. Robertson*

AMONG many interesting papers presented recently at the meetings of the Society of Naval Architects in New York, the paper by Admiral Taylor is deserving of special attention. No one will question the authority with which he writes, and it must be a great satisfaction to propeller designers to have this very simple restatement of the fundamentals of propeller design based on the experiment data accumulated through many hundreds of propeller tests and analyses. In addition, the author gives several new and simplified diagrams which should prove more convenient and serviceable than those previously published.

Almost the whole problem of propellers, or rather of the application of our present knowledge of propellers to the purposes of design, may be said to lie in a knowledge of the mutual effect of ship and propeller upon one another, and in how far these will modify the performance of propellers as tested in open water.

The water behind a ship is in a state of turbulence, some of it actually traveling in the same direction and at the same velocity as the ship; there is a film of some thickness in contact with the ship's hull which has received a certain amount of forward motion through friction; some wave action has also been set up aft of the ship, the actual movement of which depends greatly upon the position of the wave crest or hollow; and stream lines of water are flowing in, largely in an approximately vertical plane, to establish equilibrium behind the vessel. In addition to all these disturbances caused by the hull, the propeller, if running, will suck water from the space just forward of its disk, and this suction is to a certain extent acting upon the ship.

For practical purposes, all these interactions are summed up in the term "hull efficiency"; the mean forward velocity of the water aft of the ship being called wake, and generally expressed as a percentage or fraction of the speed of the ship through the water, and the speed of advance of the propeller (propeller speed) is usually written $V_a = V$ (1-wake). The loss in propeller thrust with a ship in front of it is designated thrust deduction, t, and hull efficiency (from which t is usually calculated) is $\frac{1-t}{1-w}$.

The elements determining the value of t are as yet little known, but fortunately the value is less variable than wake, and may be fairly accurately approximated by Mr. Taylor's formula, $t = 0.3\ C_b$ where C_b is the block coefficient of fineness.

The determination of wake is much more important, as propeller speeds figure in all our calculations, and Mr. Taylor's formulæ:

$$w = -0.1 + 0.5\ C_b \text{ for single screw ships}$$
$$w = -0.16 + 0.5\ C_b \text{ for twin screw ships}$$

must be considered as only roughly approximate, the wake being influenced, as already indicated, by many things besides the block coefficient. A more accurate figure may usually be obtained by using the longitudinal coefficient of the after lines, but even this will not completely designate wake value, and we are compelled to look largely to model tests and trial trip analysis for an extension of our knowledge regarding this important factor.

The use of trial trip data to obtain a usable wake fraction will be described shortly.

It is hardly necessary to insist that nearly all our knowledge of ship propulsion is derived from accurate observation of previous performances; and this means that ships' speed,

*Naval architect, Munson Steamship Line, New York.

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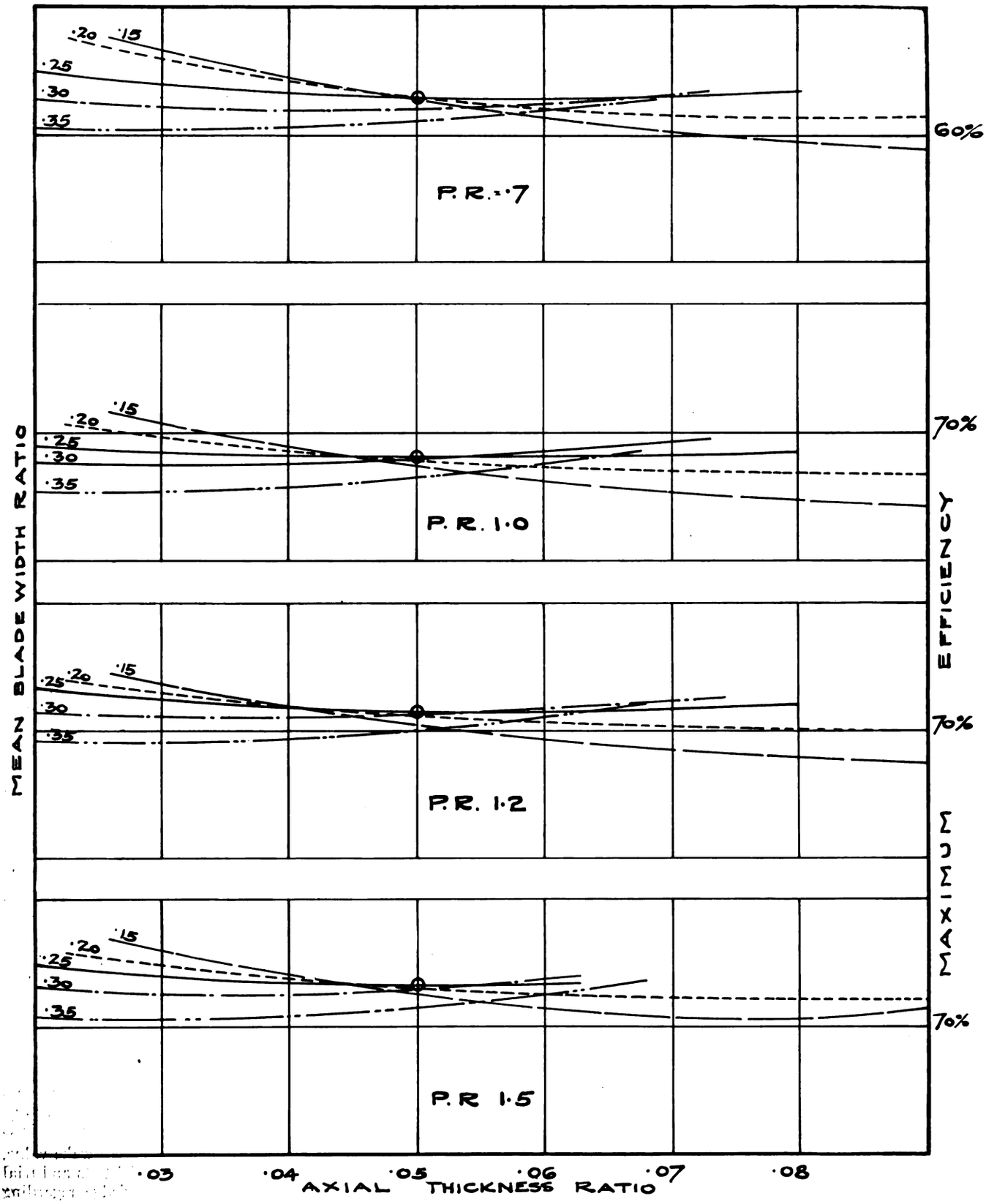

Fig. 1

for instance, on which data are to be based must be accurately obtained on a deep measured course in calm weather, with a sufficient number of runs to obtain the true means, and with turns at each end of the course ample in size so that the ship has ceased to accelerate before the speed is measured.

In like manner the measurement of power should, if possible, be carefully made and checked for accuracy before conclusions are drawn from it.

At the November meetings of the Society of Naval Architects a paper was presented giving the data recorded on the

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trials of S. S. *Modoc*, and we shall use that data to illustrate the application of Admiral Taylor's propeller curves, as there are several points wherein it is possible to make mistakes.

The *Modoc* is fitted with a sectional four-blade propeller of bronze, 13 feet in diameter and 14 feet pitch of face, the developed area being given as 61 square feet. We must assume that the blades are medium wide tip, with a root thickness of about 6 inches and a hub diameter of say 39 inches. This will give us a mean width ratio of

$$\frac{\text{Developed area} \times 2}{\text{Dia.}^2 \times \text{No. of blades} \times (1-.25)} = \frac{61 \times 2}{169 \times 4 \times 0.75} = 0.24$$

where 0.25 is the ratio $\left(\frac{\text{Propeller Boss Dia.}}{\text{Propeller Dia.}}\right)$

and an axial thickness of blade of 0.055. The Durand tests for four blade propellers will be used, but these are for slightly narrower and considerably thinner blades, and a correction factor must therefore be obtained from Fig. 4.* Here we find for a pitch ratio of 1.0 C_p the power factor for this screw is 2.24 whereas the corresponding C_p for the tested screw is 2.09. The relative power absorption of *Modoc's* screw would therefore be $\frac{2.24}{2.09} = 1.07$. But we have assumed medium wide tips for the *Modoc* propeller, say tip No. 3 in Fig. 2, the power absorption factor for which is 1.03. $1.03 \times 1.07 = 1.10$, the *Modoc's* propeller thus being assumed to absorb 10 percent more power than the tank model from which our data are drawn.

We must therefore allow a discount of 10 percent in power in calculating the ρ_p values.

You will notice the C_p value used above is not that given on Fig. 9, because what we want is not absolute values but only relative values, and Fig. 4 gives these. Suppose we compute the size of propeller suitable for *Modoc*, Run No. 5 wherein a speed of 16.15 knots was obtained with 128.7 revolutions and 2,656 shaft horsepower, the pitch being 1.077.

The model horsepower was 1,400.

Two thousand six hundred and fifty-six shaft horsepower was absorbed at the torsion meter or motor, not at the propeller. If we allow 3 percent for the friction in the tail and line shafting, we must take the power = 2,576. $V_a = 16.15$ $(1-w)$ and wake w should be, by approximate formula: $w = -0.1 + 0.5 \times 0.48 = 0.14$, where 0.48 is the block coefficient of the *Modoc*.

also $V_a = 16.15\ (1-0.14) = 13.89$

and Taylor's $\rho_p = \frac{\text{Revs.}}{V_a^2} \times \sqrt{\frac{\text{Power}}{V_a}}$

$$\rho_p = \frac{128.7}{13.89^2} \times \sqrt{\frac{2{,}340}{13.89}} = 8.65$$

where $2{,}340 = \frac{2{,}576}{1.10}$ to allow for shape of propeller.

From Taylor's diagram ρ_p for 4 blade propellers, with $\rho_p = 8.65$ as above, S = 0.221 at a pitch ratio of 1.077 as used in the *Modoc*.

Then diameter $d = \frac{13.89 \times 101.3}{1.077 \times 128.7\ (1-.221)} = 13.03$ feet

and the face pitch will be $13.03 \times 1.077 = 14.04$, these figures being within half an inch of the required result.

It will be noticed that the diagram efficiency is 0.674 which would give us an E.H.P. of $2{,}576 \times .674 = 1{,}736 =$ 336 horsepower higher than the tank tests indicated. This additional power must have been absorbed:

(1) By propeller, due to lower propeller efficiency.
(2) By low hull efficiency.
(3) By low relative rotative efficiency.
(4) By Taylor's "Margin" due to weather, fouling, etc.

The first of these losses will certainly be due to the large propeller hub and perhaps in a lesser measure due to *Modoc's* propeller departure from type.

To check up the first feature, an efficiency diagram plotted on axial thickness is here presented, Fig. 1, plotted from Taylor's Table I. This is intended only to illustrate the relative efficiencies as compared with the type test propellers, and should only be used in this way.

In explanation of items (2), (3) and (4), we may analyze the propeller performance in a manner similar to that suggested by Mr. C. F. Holt* with Froude's propeller formulæ.

This method consists of assuming various slip ratios, calculating the powers absorbed by a given propeller at these

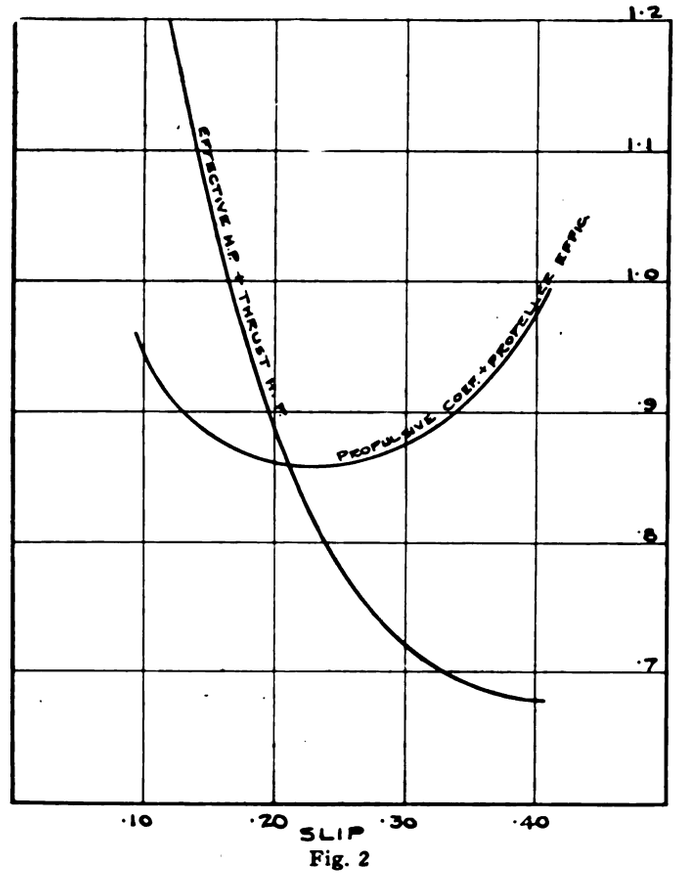

Fig. 2

slips, and ascertaining, by plotting, the power at which a balance with E.H.P. and S.H.P. is secured.

The analysis is tabulated herewith, and is largely self explanatory.

Line 9 is taken from Durand's tests for 4 blade propellers, Taylor's Fig. 10, and U, the useful power, is obtained on line 13 increased on line 14 by the power factor 1.10 for shape, width and thickness of propeller blades. At the correct slip the ratios on line 15 and line 18 will be equal. On line 17 we assume a loss of 6 percent in propeller efficiency due to *Modoc's* large propeller hub.

Propeller Analysis, S. S. Modoc, Run No. 5

1. Propeller, sectional, 4 bronze blades.
2. 13 feet diameter, 14 feet pitch, 61 square feet developed area.
3. Ratios: Pitch 1.077, blade width 0.241, thickness 0.055.
4. Blade factor $\frac{2.24}{2.09} \times 1.03 = 1.10$.
5. Performance, R. P. M. 128.7; speed, 16.15; S. H. P., 2,656.
6. E. H. P. 1,400. Propulsive coef. $1{,}400 \div (2{,}656 \times .97) = 0.543$.

8. Assumed slip ratio	0.10	0.20	0.30	0.40

*The illustrations referred to in this discussion are those of Admiral Taylor's paper.

*Transactions of Institute of Naval Architects, Vol. LXII.

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9.	ρ_u at 1.077 pitch ratio	3.95	6.40	9.90	15.0
10.	Speed of advance $\frac{14 \times 128.7}{101.3}$ (1—S)	16.0	14.22	12.45	10.67
11.	Therefore $Va^{2.5}$	1.024	762	546	372
12.	$\sqrt{U} = \frac{\rho}{R} \times Va^{2.5}$	31.43	37.89	42.0	43.35
13.	Therefore U	988	1,435	1,764	1,879
14.	U × 1.10 = thrust H.P.	1,087	1,578	1,940	2,067
15.	E. H. P. (1,400) ÷ thrust H.P.	1.289	0.888	0.722	0.678
16.	Diagram propeller efficiency	0.610	0.672	0.659	0.591
17.	Efficiency corrected for hub	0.573	0.631	0.619	0.555
18.	Propulsive coef. (.543) ÷ efficiency (17)	0.947	0.860	0.877	0.978

20.	Performance efficiency by plotting (15) and (18)	0.859
21.	Slip ratio do.	0.210
22.	Speed of advance $\frac{14.0 \times 128.7}{101.3}$ × (1—S)	14.05
23.	Wake $\left(1 - \frac{14.05}{16.15}\right)$	0.11
24.	Thrust deduction	0.144
25.	Hull efficiency (1 — .13) ÷ (1 — .144)	.984
26.	Propeller efficiency (.543 ÷ .859)	.632
27.	Rotative efficiency + margin (25) ÷ (20)	1.145
28.	Thrust horsepower (E. H. P. ÷ Performance efficiency)	1,630

Lines 15 and 18 may be plotted upon slip ratio (see Fig. 2) and thus obtain the slip ratio which is common to both curves. We may also read off what we may perhaps call the performance efficiency. From these two quantities the other data are easily obtained. Thrust deduction in this case is obtained from Taylor's formula, $t = 0.3C_b$.

From this analysis it will be noticed that the wake value is somewhat lower than that obtained by approximate formulæ. Taylor's "Margin" is 14.5 percent which corresponds to that given in the paper for ships in service. Very possibly the propeller efficiency is lower than what we assumed, but there is little information to guide us as to the effects of large propeller hubs. It is also possible that the steady bearings and stern tube absorb considerably more power than the 3 percent allowed.

By using the speed of advance ascertained by the above analysis in the ρ_p calculation given earlier in this paper it will be found that the propeller elements will be exactly computed.

Corrosion of Condenser Tubes*

Recent Investigations Prove Entrapped Air to be the Cause of Rapid Corrosion

By Major Johnstone Taylor

THE corrosion of condenser tubes, that is the rapid corrosion which often occurs, rendering tubes useless after a working life of merely a few weeks, is a serious evil with which engineers are confronted. The subject has been under very close investigation by chemists and engineers working in conjunction with the British Institute of Metals who after laborious research have come to the conclusion that the main cause of the trouble is entrapped air and that neither the composition of the tube nor its physical properties have much to do with it.

The investigators state that the general appearance of an affected tube is that of nibbled or water worn material, but under the microscope the actual metal surface is seen to be very smooth rather than roughened as with ordinary corrosion. The attack, moreover, is frequently distributed over a considerable length of tube instead of being confined to an isolated area. The whole circumference and 2 or 3 feet of its length may be affected or it may occur at the top, bottom or sides quite indiscriminately. Again, although a small amount of cuprous oxide may be present and some ferric hydrate from the water ends, there is little blue or green basic salt and no metallic copper.

*The views expressed in this article are not necessarily those of the writer. These notes are in the nature of an abstract of data on the subject published by the investigators.

Corrosion Occurs Near Tube Ends

This corrosive action is most commonly found in the first pass towards the ends of the tubes at which the water enters and generally within the first three or four feet. The first inch or two is not usually attacked except in severe cases. The remainder of the tube may be unaffected, although in the case of long tubes it has a tendency to break out again near the outlet end. It has been found that tubes not so attacked during the first weeks of their life are practically immune from rapid corrosion. There is, however, an element of uncertainty as to the liability to attack in similar condensers working under similar conditions; the tubes in one may fail in a few weeks and yet in the other case last for several years.

Condenser Tube Material

It has frequently been presumed that the composition of the metal and its physical state have an important bearing on the matter of corrosion. The investigations under review point to the fact that, provided good commercial alloy is used and that the tubes are of reasonable hardness and fineness of structure, bad mixing has little or no appreciable effect on their liability to corrosion, nor are impurities in the metal other than arsenic in any way appreciably deleterious. At the same time the examination of a large number of tubes revealed flaws, such as laminations and spills.

In addition longitudinal cavities were found sometimes extending as much as 2 or 3 feet into the tube. Often partially covered with a lip, these cavities may contain oxides of copper and zinc and sometimes a little carbonaceous matter. Though usually quite superficial, they may penetrate through one-third of the wall of the tube. Such flaws, while being mechanical defects, have not in the present circumstances been found to be the cause of rapid corrosion, tubes quite free from them being attacked, others containing them being free therefrom. At the same time in the latter stages of corrosion flawed tubes are liable to suffer considerable loss of metal by a process of mechanical loosening. No special composition of alloy showed any special resistance nor any extra liability to attack except that having high nickel content which showed a considerable power of resistance.

Observations on Condenser Flow

The foregoing conclusions led the investigators to seek the trouble elsewhere. Arrangements were made to observe the action of water passing through a model condenser with glass tubes. It was found that variations from the average speed occur in different tubes. At times, the water assumes a condition of spin and turbulent motion taking place near the inlet ends. Turbulence occurs in the water box, occasioning an irregular distribution of entangled air. Local vortices are also formed in the water ends making the distribution of this entangled air far from uniform through the tubes. The flow in individual tubes is very irregular, so much so that the entangled air may actually be impinged on the wall of the tube which is a most important factor in corrosion.

These observations are supported by the fact that in an actual condenser, observed carefully under working conditions, not only do approximately the same amount of failures occur with different brands, but that they occur mostly in the same position in the tube plate, pointing to the conclusion that corrosion is due to local conditions in the condenser itself—a segregation in different spots of the entangled air.

Thus the distribution of corrosion follows the distribution of entangled air which is a complex and uncontrollable factor. The effect upon corrosion of artificially increasing this entangled air, as was done during the experiments, was to increase its rate. The amount thereof is not the only factor in the case, however, its fine subdivision in the form of foam, which is much the same action as that caused by a

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centrifugal circulating pump, being particularly active as a corrosive agent.

THE PROTECTIVE VALUE OF SCALE

The scale, which is known to form on a condenser tube, is of different composition under different conditions; that, for instance, forming on a brass tube contains not only the constituents formed from copper but also some formed from the zinc—particularly zinc hydroxide. If this scale is highly pervious, it will afford little protection against corrosion, on the other hand if it is more or less impervious it will afford considerable protection and delay attack. Thus, the chemical stability of copper alloys in natural water mainly depends on the nature of the scale formed, its power of adhesion, its resistance to erosion, thickness and permeability.

Its resistance to erosion and to breaking away from the metal has an important bearing on rapid failure. Entangled air, it has been shown, will set up local water hammer, which ineffective on clean metal will destroy the scale and sea water, which will foam, is very destructive in this direction.

Temperature also has an effect upon corrosion, it being more rapid at low temperatures than at high ones, a fact accounting for more rapid corrosion in high vacuum condensers. An increase of temperature has the effect of assisting the deposition of metallic copper, this in turn favors the formation of a scale consisting of the zinc hydroxide, basic carbonate and oxychloride. This latter constituent confers on the scale a property of partial permeability and when in large amounts so strengthens and hardens the scale that when once formed it is not easily destroyed. Although it is somewhat permeable, corrosive action may go on beneath it.

PROTECTIVE MEASURES AGAINST CORROSION

From what has been said, therefore, it will be inferred that this rapid corrosion of condenser tubes has little or no relation to the composition of the material and that it is mainly due to entrapped air. Moreover scale on the tubes forms a protective coating, which, if it preserves the tubes during their early life, would appear to render them more or less immune afterwards. The question arises then, can entangled air be prevented or can the tubes be artificially coated with a protective scale?

In marine practice entangled air would normally be present when the ship was in motion and especially in rough weather. In the case of land plants, air leaks in the suction would cause it and it is well known that small air leaks into vacuum can go on for a long time undetected. To eliminate entangled air is obviously the first step towards prevention of rapid corrosion, but this presents many difficulties, some perhaps insurmountable. Removing it would be a costly procedure, involving cumbersome apparatus.

The point then arises as to the possibility of artificially scaling the tubes. This could possibly be done by slow circulation during the early life of a condenser giving the scale a chance of forming before it could be eroded, using as replacement tubes those which had been "seasoned" either in another condenser known to be free from corrosion or heated in sea water for a week to 40 degrees C.

In the meantime the investigators referred to are experimenting with artificial scaling methods which may go a long way towards eliminating this trouble of rapid corrosion which under the modern conditions of low temperature and high water speeds is often serious.

Operating and Maintaining Marine Impulse Turbines

Practical Suggestions on the Proper Methods of Operating, Adjusting and Maintaining Both the Turbine and Reduction Gear

By O. M. Gordon*

IN order to have a thorough understanding of the operation and maintenance of impulse turbines (General Electric) and the reduction gears for this type of machinery, it is essential to have in mind the fundamental theory of the design.

There is no close blade or bucket clearances in the impulse turbine like that found in the reaction turbine, because the steam expansion takes place entirely in the stationary nozzles or diaphragms. With this condition, we have the same steam pressure on the exhaust side as on the admission side of the moving blading or buckets that revolve with the rotor. Due to this equal steam pressure on both sides of the rotor wheels, it is impossible to have any steam leakage past the ends or the periphery of the moving buckets.

Aside from this advantage (elimination of close blade clearances), the rotor is practically kept in balance fore and aft. Thus, the axial thrust on the rotor due to steam pressure is practically nil. To further take care of any axial thrust the rotor disks have several 2½-inch holes in them to permit any possible built up pressure to leak through.

REACTION TURBINES

The reaction turbine (Westinghouse, Parsons and others) expands the steam in the various stages of the moving blading as well as in the stationary ones. Due to this fact, it is necessary to have close running clearances on the blade tips to prevent steam leaking by and not doing useful work. A dummy piston and cylinder keeps this rotor practically in balance. (I cannot go into details of the reaction turbine here, but hope to in the near future.) These tip clearances range from 0.035 inch to 0.065 inch, which is a good margin of safety, provided the engineer will keep the lubricating oil in good condition and frequently check and record the wear of the rotor bearings with the bridge gages supplied with each unit.

THRUST BEARING ON THE IMPULSE TURBINE

Of course it is necessary to have a thrust bearing on all turbines. The General Electric Company manufactures its own turbine thrust bearing (some engineers get it mixed with the well-known Kingsbury type), consisting of a steel collar keyed to the turbine rotor shaft and two babbitt faced thrust rings (ahead and astern rings) split horizontally with pins at the horizontal joints to keep them in place. The top half of each ring is slotted, into which pins, fastened in the top half of the housing, fit to prevent the rings from turning. The thrust bearing complete is secured to the forward end of the forward rotor bearing and is a spigot fit.

The shims between the rotor bearing and thrust housing, control the fore and aft location of the rotor, *i.e.*, if it is desired to change the wheel or bucket clearances of the rotor, it can be done by inserting more shims, which will move the

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rotor and thrust bearing complete, forward or take out shims which will move the rotor aft. The shims between the forward part of the thrust housing and the end plate control the actual oil clearance on the thrust rings and collar, which should be 0.008 inch. Before making any thrust bearing adjustments, the wheel clearances should be taken, also the squealer ring clearance. Mark all parts and take out or install new shims as the intended adjustment may require.

Results of Improper Drainage of Turbine

I can say, without fear of contradiction, that our principal trouble recently with the impulse turbines is the serious corrosion of the internal parts. This is undoubtedly caused by three things: (1) Bad boiler feed water; a certain amount of salt deposits carried over into the turbine. (2) Improperly draining and drying out turbine when idle. (3) Leaky main steam stop valves and leaky maneuvering and astern guarding valves. It is very essential that these valves be kept tight at all times. If not tight when running ahead, especially on a long voyage, the steam blowing into the astern element will rapidly deteriorate the entire astern element by serious corrosion and erosion of the steam vanes and buckets or blading.

Never permit a leaky condenser to operate on any turbine job. You can readily see what effect this will have on the entire steam plant and especially the turbine. Salt boiler feed water is the worst enemy of the marine turbine. Several cases have come under my personal observation where the main condenser was leaking and instead of making at least temporary repairs, the vessel was kept under way, with the ultimate result that the turbine finally stopped from the use of sea water. The vessel was towed into port and of course the turbine needed extensive repairs.

Some engineers have kept the internal parts of the turbine in very good condition by the use of kerosene. It also helps the boilers. Put about one quart of kerosene in the turbine through the plug in the upper half of the casing or through a head gage line, provided no lubricator is fitted for this purpose. This procedure should be followed just before getting under way.

In warming up the turbine preparatory to getting under way, after the auxiliary machinery is in operation, the first kick-over on the turbine should be made with the astern turbine. This is important in that any water that might collect in the steam line will pass out through the two stages astern instead of going through the many ahead stages.

Blading and Bearing Clearances

The engineer will find it very easy and should by all means keep a complete record of all bearing clearances by taking leads; of wheel or bucket clearance by using a wedge; of thrust and squealer ring clearance by a feeler gage. These records are very important and should be taken at frequent intervals and any changes noted.

The emergency over speed governor (it is not a regulating governor) is for the purpose of checking the rotor speed in case the load is suddenly thrown off the turbine by breaking the shaft, throwing off the propeller blades or stripping the coupling. (Indeed, I know of one case where the coupling stripped and the rotor "ran away," throwing a large piece out of the fifth stage wheel that completely wrecked the turbine.) It is very easy to trip the governor every day and be assured that it will function in case of emergency.

With the ring type over-speed governor on the forward end of the rotor, two ½-inch weights are supplied; one about 2⅛ inches long and the other about ⅝ inch long. The short weight will trip the governor about 10 percent over speed on the turbine. The long weight is for test purposes only and will trip the governor at about 2,700 revolutions per minute on rotor. It is, of course, difficult to get the turbine up to 10 percent over speed with the gears and propeller shaft connected. For that reason, the test weight is supplied and any time, by removing the short weight and inserting the long one, the entire performance of the governor can be demonstrated, which is very important.

When securing the turbine after a run, it is very desirable that the gland seal steam be shut off and the main air pump or other vacuum apparatus be left in slow operation for about one hour, in order to thoroughly dry out the turbine. When the vacuum apparatus is secured, it is very important that the bilge drain be opened to keep the turbine free from any water that might collect inside.

When the turbine is idle for some time the vacuum apparatus should be run daily for about one hour with the bilge drain closed, in order to dry out the turbine. After this operation, open the bilge drain again and during the operation, jack the turbine over one or two revolutions, never permitting the rotor to come to rest in the same position. If this procedure is not followed, serious corrosion to the internal parts is likely to occur.

The tolerance on the rotor bearing clearances is 0.004 inch per inch diameter of journal. The original fitting is 0.001 inch per inch diameter of journal. If permitted to become greater the rotor will have a tendency to jump in the bearings and set up vibrations which will damage the diaphragm packing inside and impair the efficiency of the turbine by steam leakage past the packing sleeve on the rotor and packing ring in the diaphragm.

Vibration is a very serious thing in any turbine aside from reducing the efficiency—it is, if let go, inviting disaster. It is usually caused by serious corrosion of the rotor disks and erosion of the rotor buckets or blading, which can be prevented to a very great extent if the boiler water is kept fresh and the turbine properly cared for, *i.e.*, maneuvering and astern guarding valves kept tight and turbine drained and kept dry internally as heretofore outlined.

Vacuum Losses

Vacuum, as we all know, is very essential to efficient operation of any turbine unit, and ordinarily 28 inches can be maintained on any unit, which is an exhaust temperature of 101 degrees F. There are three principal causes of vacuum loss: (1) Insufficient circulating water passing through the main condenser, which can be easily checked by injection and overboard discharge temperatures. (2) Inefficient vacuum apparatus; with the air pump, leaky valves or bad bucket packing; with the radojet and condensate pump, radojet nozzles might be eroded and enlarged, strainers partly plugged; too low steam pressure or second stage disk out of adjustment; condensate pump not handling the volume of water, due to reduced speed or leaky impeller seal rings, permitting water to by-pass from discharge to suction chambers. (3) Leaks in the turbine exhaust and drainage system. To find leaks, fill the entire system with water, using steam on the gland seals to prevent the water leaking out around the turbine glands and getting into the lubricating oil system. These troubles can easily be taken care of and a good vacuum maintained at all times, provided the installation is right.

The main steam strainer is placed in the main steam line just above the emergency valve to catch all foreign substance that is likely to break away from steam pipes or otherwise enter the boilers and piping. It is very important that the strainer be kept clear at all times, insuring a maximum and constant steam flow.

The flexible coupling driving the high speed pinion gear can be examined when taking leads on the after rotor bearing with the housing removed. It should be seen that the coupling is free, oilways clear and that the amount of wear in the jaws or pins and bushings is carefully checked and noted. If a double jaw coupling is used, when rotor is lifted, carefully examine the plunger, spring and steel plate of the

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shock absorber inside the coupling; also examine the brass bearing strips on the rotor and pinion shafts.

On many jobs where the lubricating oil system to the rotor bearings has been changed to the "overshot type," I have noted that the orifice plates supplied for this change were installed on the thrust bearing, instead of on the rotor bearings as intended. These plates fit in the oil supply line to both rotor bearings. The orifices in the plates are smaller in diameter than the pipe, which gives the oil a higher velocity to the bearings. The plates are stamped with instructions which should be observed.

The fundamental reason for this change is to introduce the oil supply with the rotation of the rotor in the ahead direction, instead of against the rotation, which has proven more satisfactory in that a larger volume of oil goes through the bearings and produces a lower running temperature.

OPENING TURBINE FOR EXAMINATION

On opening the turbine for examination, and this should be done at least once every two years and oftener, if the machine is not operating satisfactorily, it is well to look out for eroded and enlarged steam nozzles, both ahead and astern. This condition will increase the steam volume and reduce the velocity, thus reducing the efficiency of the turbine. Carefully examine all ahead and astern diaphragms, also the ahead intermediate holder (first stage stationary buckets or blading) for serious corrosion. Use a chipping hammer or scraper to knock off the scale, in order to ascertain the extent of corrosion.

The writer has seen the steel vanes (cast in) in these diaphragms corroded and wasted away to practically nothing, which is a dangerous condition, as they are liable to carry away under steam pressure and wreck the entire machine. The writer has seen these carry away on several turbines.

Bad steam leakage at the horizontal joints is not unusual where the diaphragms have been badly corroded, although the packing strips prevent this to a great extent. In some cases the leakage is by the ends of the packing strips and on the casing joint. At this examination carefully check bearings, couplings and all diaphragm and gland packing for possible wear.

Diaphragm packing rings are fitted into each diaphragm for the purpose of preventing steam leakage. These rings are slightly adjustable and can be fitted to just touch the packing sleeve on the rotor. This insures practically a steam tight joint, which is very desirable from an economical standpoint.

There are two nozzle control valves in the turbine head. The port valve controls two nozzles. The starboard valve controls three nozzles. The maneuvering valve controls seven nozzles, making a total of twelve nozzles (ahead turbine). These nozzle control valves should be kept tight and in good operating condition.

The ahead nozzle block carrying the twelve nozzles is bolted to the upper half of the turbine head, as is the intermediate holder which also carries the first stage stationary buckets. The astern nozzle ring is split horizontally, each half being bolted to the upper and lower halves of the turbine casing. The astern diaphragm complete is secured the same as the nozzle ring and over it.

Both ends of the turbine casing have 2½-inch holes tapped with a pipe plug inserted for access to the rotor balancing holes. These holes are drilled to come in line with threaded balancing holes tapped into the first ahead and first astern rotor disks, where the balance weights are inserted through the holes in the casing.

It is, of course, impossible to fit the gland packing steam and air tight. It, therefore, becomes necessary to take care of the steam leaking past the rotor sleeves and packing, also to prevent ingress of air, which impairs the vacuum. To take care of this, steam sealing and leak-off is resorted to. Sealing both the ahead and astern glands with live steam becomes necessary when the turbine is idle or running very slow, with reduced pressure. This is accomplished by means of two pockets on the ahead end and one pocket on the astern end, into which is led 2½-inch piping.

For sealing, live steam is admitted to the inner pocket on the ahead end and to the one pocket on the astern end. When the turbine is operated about half or full power, the live steam is shut off and the leakage to the inner pocket on the ahead end is used to seal the astern gland. In case too much steam is leaking by the inner pocket for sealing purposes, the outer pocket will blow steam out into the engine room. To take care of this excess steam, a leak-off pipe is led from the outer pocket to the fourth stage diaphragm. Vacuum at this point takes care of this excess leakage. This valve is marked and should be opened just sufficiently to prevent steam blowing in engine room.

The foundation bolts and chocks should be carefully examined at frequent intervals to insure that they are in good condition and absolutely tight. An oil guard is fitted to each rotor bearing shell on the ends next to the turbine casing for preventing oil leakage from the bearings. To further guard against oil leakage from the bearings and steam from the turbine glands blowing through and mixing with the lubricating oil, an oil deflector (aluminum ring) with an air shield attached is installed. The deflectors are accessible by lifting the bearing housing and should be neatly fitted to the rotor in order to make them tight.

The reduction gears should be carefully examined at frequent intervals and a complete record kept of the mileage run, pitting, undercutting and wire edge; in fact, all conditions that are subject to change. Check all bearing and coupling clearances and keep a complete record of them.

The fore and aft location of the main shaft should be carefully observed at frequent intervals. The main thrust bearing controls the fore and aft location of the entire train of gears and should be adjusted as often as necessary, in order to keep gears in their original central location in relation to the gear case.

LUBRICATING OIL SYSTEMS

Some turbine units have what is commonly known as the gravity system, whereas some have the so-called direct system. I have found many advantages in the gravity system over the direct system. With the direct system you work with about 500 gallons of oil, pumping this continually from the sump tank through the coolers and into the gears and bearings, whence it drains back into the sump tank again. If, for any reason, the pump should stop (sometimes they do) the oil supply is immediately discontinued. (System in Hog Island type ships have non-return valve which opens from gravity tank in case pump stops.) Indeed, I have seen several complete units which have been wrecked due to using the direct system and the pump ceasing to function. With the small quantity of oil, it is constantly in a whirl and has absolutely no chance to settle.

With the gravity system, a larger volume of oil is used, about 900 gallons, which is very desirable. The gravity tank holds about 600 gallons, while the working level in the sump tank is about 300 gallons. The oil is pumped from the sump tank through the coolers and into the 600 gallon gravity tank. The oil is discharged in the tank at the top, which permits any air contained in the oil to escape. The supply pipe from the tank to the gears and turbine is usually about 4 inches or 5 inches in diameter and is led to the side or bottom of the tank. In either case it extends about 8 inches above the tank bottom, which gives the oil a chance to settle and the impurities to settle on the bottom of the tank. The writer has seen as much as 6 inches of sludge and dirt in these tanks. The lubricating oil system should be examined each voyage and, if necessary, cleaned.

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Marine Insurance Cheaper Today Than Before the War

Retrospect of 1923—Mexican Detention Charges—Liability for Overflow Damage—Black Sea Mines—Clan Gordon Case

By "Bordereaux"

NOW that the results of 1923 are fully known to marine underwriters, a word or two of retrospect may not be inappropriate. Put briefly, very few marine insurance companies made money last year. This was not the consequence of a high loss ratio, because losses were moderate; but because the rates have been systematically and steadily lowered, under spur of the hottest kind of competition. In a word, the trouble with the American marine underwriting market is that it is too large for the business that comes to it. The older and more experienced officers realize the grave seriousness of rate depressions, and yet they have to have business, as well as the venturesome, rate-cutting newcomers, and too often they yield to this impulse and meet the reductions. The folly of so doing is apparent. Prices of almost all other commodities and necessities of life continue to soar, and yet we find marine insurance cheaper today than it was a year ago and, in most instances, lower in price than before the war. There has also been a steady broadening of conditions, so that the underwriter is accepting more chances for less money.

As regards losses during 1923, the Pacific Coast had an unusually bad record, the Gulf Coast was exceptionally free from anything like serious reverses, the Atlantic Coast remained about normal, and the Great Lakes turned in a fortunate experience despite the remarkably heavy freight movement there throughout the season.

Cargo business was satisfactory in volume in 1923, but hull writings were light, much of the latter going to London.

Theft and pilferage losses showed a substantial reduction over those of 1922, always excepting German, Greek and Mexican business, but the improvement has scarcely kept pace with the lowering of rates for these hazards.

A very considerable amount of American export insurance went abroad last year. In Australia, India and South America there was great activity on the part of the representatives of foreign insurance companies, domiciled in those countries, in securing the coverage on our exports. American underwriters now realize the necessity of meeting that competition by having agencies of our own companies on foreign ground, and to this end there has been a fine support of the American Foreign Insurance Association, which is a cooperative effort on the part of American insurers to establish themselves outside of our country as well as in it. The Marine Insurance Department of this association has now a membership of fourteen companies. They are represented in fifteen countries by seventy-five agents. Marine Manager John Ferguson, of the association left New York on January 8 for a six months' business trip through Japan, China, Java, the Philippines, Australia, New Zealand, and back home by way of San Francisco. It is his purpose to establish a personal contact with the problems and insurance peculiarities of those countries and to appoint additional agents.

Conscious of the perils of prophecy, I hesitate to forecast the trend of 1924; but still I am of opinion that there is ground for believing that influential marine offices will show a firm front against further rate reductions or broadening of underwriting covers, and that despite the low state of American shipping the continued prosperity of American business, which seems well assured, means continued heavy imports, even though our export trade were to dwindle hopelessly during the period.

Mexican Detention Charges

AMERICAN underwriters, like so many others, are revising their judgments of the Mexican revolution and preparing to meet the problems created by it. At first it was thought that the activities of the rebels would be of short duration, but they are surprising outsiders with their pertinacity, and the situation grows more complicated daily. Vera Cruz, in the hands of the rebels, has been the particular thorn in the side of shipping. Americans are not consigning to that port any more, but this gives little consolation to those merchants who had sent merchandise there before the outbreak of hostilities and were nipped in the vise. Few of them had thought it necessary to protect themselves by insurance against strikes, riots and revolutions, and their goods lie unguarded on the Vera Cruz wharves subject to wholesale pilferage and destruction. The ordinary war risk covers apply only to risks at sea, and not to land; nor do strike and riot insurances include revolutions. Shippers with goods at Vera Cruz are seeking cover against the perils to which they are exposed, but they are finding it hard to get, and the prices range from three to five percent.

Perhaps the most complicated of all problems raised by the revolution is that involved by the holding at Tampico by the Mexican Federal authorities of the Ward liner *Esperanza*, pending payment of a three-fold duty and a penalty on goods laden aboard her at Vera Cruz. The rebels in command at Vera Cruz allowed goods destined for this country to be placed aboard her upon payment of the usual export duty. The *Esperanza* then proceeded to Tampico to load additional cargo and was immediately held by the Federals, in command of that port, on the ground that she had not cleared legally from Vera Cruz, and demanded extra duties and a penalty. To prevent further delay, the Ward line gave a bond for the payment of the Tampico charges and proceeded to New York, where reimbursement was asked from the cargo owners for amounts advanced on their behalf. The cargo owners then claimed the amounts from their underwriters, in most cases under the war risk cover.

There has been much conferring by the insurance men with their legal advisers, and it is unlikely that they will pay the costs. They argue that the assessment of a tax presupposes protection, and this they failed to receive when the authorities were unable to hold the control of Vera Cruz.

The perils clause of the Lloyd's, or basic, form of marine policy covers, among other hazards, "arrests, restraints and detainments of all kings, princes or people of what nation, condition or quality soever." Most marine policies contain what is known as the war clause, which relieves the underwriters from liability for capture, seizure, detention or destruction by the acts of hostile forces, or by the acts of officers or others acting in the name of belligerents, etc. This latter clause will be waived by the underwriters in consideration of additional premium and, when so waived, the policy is said to cover the risks of war. The underwriters, in waiving the war clause, generally expressly confine their liability to cover only while the goods are waterborne.

With respect to the so-called duty collected by the rebels at Vera Cruz, as that payment was made to prevent detention or restraint by a hostile force, it would be excluded by the war clause. If the war clause had been waived and the

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waiver were limited to waterborne risks the underwriters still would not be liable, as the acts of the rebels took place on shore. But had the war risk cover been extended to the shore, or had the policy been extended to cover against the acts of revolutionists, the underwriters might well be considered liable for the exaction paid at Vera Cruz.

Liability for Overflow Damage

SEVERAL interesting questions involving shipowners' and underwriters' liability have been raised by the damage to cargo per steamer *Steel Navigator*, at Calcutta, due to the overflow of a tank. There was a considerable amount of such damage to goods in the 'tween decks and lower hold No. 5. The tank was in the after-peak. The overflow was caused by the failure of the crew to properly secure the manhole plate in the top tank before filling. Apparently, the plate had been placed in position, but not screwed down, with the result that when the tank filled, the pressure of the water raised the plate permitting a heavy overflow of water into the 'tween decks, which not alone damaged the cargo stowed in the 'tween decks, but leaked through the deck and caused heavy damage in the lower hold. Tapioca, sugar, flour and rubber showed the greatest amount of damage, the flour being caked and mildewed.

The outlet of the overflow pipe of the tank was being watched from the main deck by a member of the crew for the overflow that would indicate that the tank was full, but the condition of the manhole plate foiled this safeguard. It is stated that the owners of the vessel are represented at Calcutta by agents who act for them in obtaining cargo and supervising the supplying of the ship.

Clearly, if any recovery is to be had from the underwriters, the assured must look to the term "perils of the sea," as no other portion of the perils clause could cover a loss of the nature of the one under consideration. As "perils of the sea" has been held to cover only those hazards or damages which are peculiar to navigation of the seas, it can be readily seen that the overflowing of a tank due to the negligence of the crew in filling it is not in any sense a danger arising out of the seas. It is, therefore, obvious that the damage in this instance is not recoverable under a Lloyd's basic form of policy.

However, if the goods in question were insured against fresh water damage in addition to the basic perils, the underwriters would seem to be liable, as the damage was occasioned by fresh water pumped from the Hooghly River. Likewise, if the rubber and other cargo were insured against all risks or against damage from any external cause the underwriters would be clearly liable under their policies for the fresh-water damage. In both this country and England it is well settled that negligence of the master or crew is not a good defense to a claim under a marine policy.

Whether or not the shipowner is liable is beside the point, so far as the responsibility of the underwriters is concerned. The liability of the insurance company stands or falls on its contract with the assured, as set forth in the marine policy, and such liability cannot be increased or diminished in the first instance by a contract entered into between the assured and a third party, such as a bill of lading or by the passage of an act relating to the liability of a third party, such as the Harter Act. The carriers' clause found in most marine insurance policies provides that the underwriter shall not be liable for any loss or damage to goods for which the carrier is liable at law. This clause would, therefore, seem to change the liability of the underwriter with each change in the liability of the carrier, but such is not the practical working of the clause. The carriers' clause was not adopted as a defense against the assured, but simply as a means of counteracting clauses in the bill of lading which seek to give the carrier the benefit of the shipper's insurance.

In view of the fact that the cargo damage, in the present instance, occurred while the vessel was in her port of loading, and not at sea, it would seem as though the Harter Act does not operate to excuse the shipowners for the negligence of their servants in making the ship ready for sea. If the Harter Act can be made to apply to this case, the assured, with a Lloyd's basic form of policy, is left unprotected and must himself stand the loss.

Mines in the Black Sea

CAPTAINS of a number of vessels have advised the port authorities of Odessa by radio that large numbers of mines are floating about in the Black Sea. Marine underwriters have been greatly interested in the probability that this was the cause of the sudden sinking of the United States Shipping Board steamer *Conejos*, in those waters, a short time ago. If this can be established, the underwriters will regard the loss of this vessel as a war loss. One thing is certain, namely, that war rates will be rigidly maintained as regards the Black Sea for some time to come.

Damages by Towing Steamer

IT was recently held by Federal Judge Dooling, at San Francisco, that the owner of cargo on board a tow has the right to recover damages occasioned by the towing steamer, even though both steamer and tow are the property of the same owner. The case arose out of the collision between the merchant vessel *Ravenrock*, owned by the British Government, and the steamer *San Joaquin No. 4*, property of the Sacramento Navigation Company, in Carquinez Straits near Port Costa, in November, 1921. The *San Joaquin* was towing five barges at the time, laden with grain and merchandise, and one of these was sunk. The cargo owner brought suit for $13,000 damages against the Sacramento Navigation Company, which owned both barges and towing steamer. The *Ravenrock's* owners also sued for damages and won. The navigation company lost, as owners of the barge, not as owners of the towing vessel, the court holding that the Harter Act, which would have relieved the carriers from the consequences of negligent navigation, did not apply in this case. The navigation company sought to have the two vessels considered as one for the purposes of the case, but this was not allowed by the court.

The "Clan Gordon" Case

MARINE underwriters in this country, as well as in England, have been gratified by the decision of the House of Lords, in the appeal by the Standard Oil Company of New York, granting the latter a judgment of £111,235 as regards its cargo claim in the famous case of the *Clan Gordon*. She was a turret-deck steamer of the Clan Line, and the cargo consisted of case oil and wax shipped at New York for China. Two days after sailing the master pumped out two ballast tanks, with the result that the vessel turned turtle and sank when an attempt was made to go about under a rapid action of the helm. The cargo owners sued the owners of the ship and won a judgment for £97,892 in the Scottish courts, but the Court of Sessions reversed it. An appeal was then taken to the House of Lords, and this has been successful.

This disposes of the cargo claim. The liability of the hull underwriters for the loss of the vessel remains to be passed upon. In this connection it may be pointed out that while there is no implied warranty of seaworthiness in a time policy, yet if the vessel is sent to sea in an unseaworthy state, with the privity of the owners, the insurer is not liable for any loss attributable to unseaworthiness.

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Applications of Arc Welding to Ship Construction—VII

Lloyd's Rules and Regulations for the Application of Electric Arc Welding to Ship Construction—Corrosion—Bibliography

By E. H. Ewertz*

Circular No. 1374

Lloyd's Register of Shipping

71, Fenchurch Street London, E. C. 3.
12th June, 1922.

Dear Sir(s),

Reverting to previous circulars (Nos. 1227, 1314 and 1328) regarding the Society's requirements and practice in respect of Autogenous Welding, I am directed to inform you that the whole of the subject has been carefully considered by the Committee who have now adopted the Regulations set forth in the accompanying Notice No. 1373.

These regulations supersede the earlier circulars referred to above and I have to request that you will be guided accordingly.

I take the opportunity to send for your information in this connection the following general remarks:—

(1) As regards Ship construction only two vessels have been built under the supervision of this Society up to the present time in which Electric Welding has been used as a substitute for riveting entirely throughout the structure. One of these is a coasting vessel, 150 feet in length (M.V. "Caria" *ex* "Fullagar," 100 A1, Electrically Welded, Subject to Annual Survey—Experimental) and the other a harbor vessel, 50 feet long (M.V. "Esab IV", A—, For towing purposes on the West Coast of Sweden, Electrically Welded, Subject to Annual Survey—Experimental). So far as is known the results in these cases have been entirely satisfactory. Several other small vessels, including a ferry boat built in Japan, have been constructed in a similar manner, but no particulars are available in the Society's London Office. As regards parts of ship structures, welding has been adopted instead of riveting with good results in the fore and after peak tanks and other tanks intended for oil in the coasting vessel referred to above and has also been utilized in numerous cases as a means of securing oiltightness in seams of oil fuel bunkers and similar parts of the structure and has always achieved the object aimed at when the work has been executed properly.

(*See Regulations, par.* 1a.)

(2) As regards the shell plating of boilers it is to be noted that the Board of Trade requires (as per the Board's Circular No. 1596) that in no circumstances should any part of a boiler in a passenger steamer be welded if wholly in tension under working conditions, but that within limits, welding may be employed for repairing cracks in furnaces, combustion chambers and so forth, and in the same parts for reinforcing the edges of leaky seams.

(*See Regulations, par.* 2.)

I am, Dear Sir(s),
Yours faithfully,
ANDREW SCOTT,
Secretary.

Notice No. 1373.

Lloyd's Register of Shipping

NOTICE IS HEREBY GIVEN THAT THE FOLLOWING REGULATIONS HAVE BEEN ADOPTED BY THE GENERAL COMMITTEE REGARDING THE CONSTRUCTION AND THE REPAIR OF THE HULLS, ENGINES AND BOILERS OF VESSELS BY MEANS OF AUTOGENOUS WELDING.

1. *Hull.*—(*a*) If it is desired to employ welding in the construction of a vessel or in any member of a vessel's structure subject to severe alternating stresses, it is only permissible to use a system of electric welding which has been approved by the Committee as having complied with the "Tentative Regulations and tests to be complied with by all Systems of Electric Welding for which the approval of the Committee of Lloyd's Register of Shipping is desired," *see* page 3.

(*b*) Oxy-acetylene welding or electric welding may be adopted for the repairs of fractures to the shell plating at the ends of a vessel, or to stern frames and shaft brackets, where the workmen are known to be experienced in the use of these processes and the welding is carefully examined and tested on completion. Such repairs are only considered to be temporary, but may be accepted as permanent if, on examination after a sufficient lapse of time, they are found to be satisfactory.

(*c*) The following minor and non-structural items in vessels building to the Society's classification are not subject to restrictions regarding the system of welding which may be employed:—

Deck Rail Stanchions to Plating.
Fastenings for Detachable Rail Stanchions
Joints of Continuous Railing Rods.
Attaching Deck Collars (L Rings) around Ventilators.
Attaching Deck Collars (L Rings) around Funnel.
Attaching Cape Rings.
Attaching Galley Fixtures to Plating.
Attaching Bath and other Fixtures in Officer's Quarters.
Attaching Cowl Supporting Rings to Ventilators.
Butts of Bulwark Rail.
Skylights over Galley.
Engine Room Skylight.
Engine Room Stairs and Gratings.
Boiler Room Stairs and Gratings.
Attaching Engine and Boiler Room Stairs and Gratings to Plating.
All Stairs and Ladders, including Rail Attachments.
Door Frames to Casings, Hinges, etc.
Clips for attaching Cleating to Casing.
Entire Screen Bulkhead.
Coal Shoots.
Butts of W. T. and O. T. Boundary Bars on Bulkheads or Floors in Double Bottom.
Ventilator Cowls.
Funnels and Uptakes.
Bulkheads (which are not structural parts of the ship).
Partition Bulkheads in accommodation.
Framing and Supports for Engine and Boiler Room Flooring or Gratings.
Cargo Batten Cleats.
Tanks (which are not structural parts).
Hand Rails on Exterior and Interior of Deck Houses.
Deck Houses not covering unprotected openings through weather decks.
Reinforcing and protecting angles round manholes.
Joints of W. T. Angle Collars at frames in way of W. T. Flats.

(*d*) Welding as a means of repair of rudder stocks has not been approved.

2. *Engines and Boilers.*—(*a*) Electric and oxy-acetylene welding processes may be used for effecting certain repairs to the furnaces, combustion chamber plating, tube plates and so forth, and for filling in wasted places at these parts of boilers, subject to the restriction that the workmen are known to be experienced in the use of these processes and that the welding is carefully examined and tested on completion.

(*b*) Repairs by means of welding are not allowed for the shell plating of boilers, with the exception of the landing edges of the circumferential seams.

(*c*) Repairs by welding process to shafting, piston and connecting rods and so forth are not permitted.

Valve rods and eccentric rods, where reduced in diameter by wear, may be repaired by autogenous welding, provided the sectional area of the reduced part is not below that required and that the usual conditions with regard to such repairs are carried out to the Surveyor's satisfaction.

(*d*) Approval has been given in some cases to the repair of sole plates and columns of engines by welding, but all such proposals must first be submitted for the consideration of the committee.

(*e*) It is also permissible, to a limited extent, to employ welding to fill in surface defects in steel castings to provide sound surfaces

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for jointing at places which are not subject to stress. This concession, however, does not apply to flaws which may effect the strength or utility of the castings.

By order of the Committee,
ANDREW SCOTT,
Secretary.

71, Fenchurch Street, London, E.C. 3.
18th May, 1922.

TENTATIVE REGULATIONS AND TESTS TO BE COMPLIED WITH BY ALL SYSTEMS OF ELECTRIC WELDING FOR WHICH THE APPROVAL OF THE COMMITTEE OF LLOYD'S REGISTER OF SHIPPING IS DESIRED

1. The cost of carrying out the required tests must be borne by the proprietors of the system of welding tested.

2. All test pieces must be prepared in the presence of a representative of the Society and all tests must be carried out under his supervision.

3. The steel used in the preparation of the specimens must be ordinary ship steel, having a tensile strength of from 28 to 32 tons per square inch.

4. The welding of all specimens must be executed in accordance with the company's usual practice.

5. A chemical analysis must be made of the metal of an electrode and of the deposited material of a weld made by the same electrode.

6. A series of microphotos, magnification 100 diameters, must be prepared, showing the structure of the material of the weld, that of the plain plating adjacent to the weld, and that of the actual junction between the original and the added material.

7. *Tensile Tests.* Two sets of tensile test pieces with butt joints shall be prepared, each set consisting of specimens of different thicknesses, viz.:—¼", ½", ¾", and 1", together with a corresponding series of unwelded pieces. Each test piece shall be 24" in length by 3" in breadth, the breadth to be reduced to 2" for a distance of 6" on each side of the center. The surfaces of the welded joints must be machined so that the thickness of the specimen in way of the weld is not greater than that of the plain plate. The average tensile strength of the welded joints thus measured must not be less than 90 percent that of the unwelded plate.

In addition to the above, two specimens 20" in breadth and ½" in thickness, with transverse butt weld, must be made, suitable for testing a 300 ton machine. In this case the surface of the welding need not be trimmed, but may be left slightly above that of the adjacent plating to the extent that would be adopted in actual practice. Small test pieces must be cut from the plain plate to determine its tensile strength. The tensile strength of the above butt welds should be about 90 percent of that of the plain plate.

8. *Modulus of Elasticity.* In order to permit the modulus of elasticity of the deposited material to be determined, two specimens shall be prepared from pieces of mild steel 25" in length, 3" in breadth, and ½" in thickness, by cutting out a central rectangle about 13" long and 1¼" wide, and filling this space with deposited material. These specimens to be machined to the usual test piece form, leaving a central portion, about 1" in width, of deposited material only.

9. *Alternating Stress Test.* A flat plate, ¾" in thickness, and 3 feet in length, to be cut through at a distance of 9" from one end, and the two pieces butt welded together. The plate to be then cut into longitudinal strips, 15 in number, ¾" in breadth, and these strips turned into round bars.

The bar to be tested will be fixed in a lathe running at about 1,000 revolutions per minute, and will be so loaded that a uniform bending moment is applied to that portion of the bar containing the weld. The loads to be adjusted so that for different bars the stress applied will vary from 12 tons per square inch to 6 tons per square inch, and the number of revolutions at which the bars break under each stress to be noted in order that a graph may be drawn.

At an applied stress of ± 6 tons per square inch the welded bars must be able to withstand approximately 5,000,000 revolutions.

10. *Impact Test.* Two specimens, ¼" and ½" in thickness respectively, to be prepared of dimensions 5' 0" x 2' 6", having a butt weld in the center parallel to the shorter edge.

The plates to be arranged on supports, spaced 4' 6" apart, placed parallel to the short edges of the plate and raised about 18" from the ground. The specimens should be able to sustain two successive blows from a falling weight as detailed below, without showing any sign of fracture of the weld:

Thickness of Plate	Weight to be dropped.	Height from which weight to be dropped.
¼"	2 cwt.	9 feet
½"	4 cwt.	12 feet

11. The Committee may require, in any particular case, such additional tests as may be considered necessary.

Extract from the Rules for the Building of Steel Vessels

TENTATIVE REGULATIONS FOR THE APPLICATION OF ELECTRIC ARC WELDING TO SHIP CONSTRUCTION

GENERAL

Section 74. The following Provisional Rules have been adopted as a tentative measure for the classification in Lloyd's Register Book of vessels electrically welded, subject to the notations "Experimental" and "Electrically welded."

The approval of the Society will be given to any system of welding which complies with these Regulations, and consideration will be given to any alternative constructional arrangements which may be submitted for approval.

SYSTEM OF WELDING AND WORKMANSHIP

Section 75. 1. The system of welding proposed to be used must be approved and must comply with the regulations and tests laid down by the Committee.

2. The process of manufacture of electrodes must be such as to ensure reliability and uniformity in the finished article.

3. Specimens of the finished electrodes, together with specifications of the nature of the electrodes, must be supplied to the Committee for the purposes of record.

4. The Society's Surveyors shall have access to the Works where the electrodes are manufactured, and will investigate, from time to time as may be necessary, the process of manufacture to ensure that the electrodes are identical with the approved specimens.

5. Alterations from the process approved for the manufacture of electrodes shall not be made without the consent of the Committee.

6. The regulations for the voltage and amperage to be used with each size of electrode, and for the size of electrode to be employed with different thicknesses of material to be joined, are to be approved by the Committee.

7. The Committee must be satisfied that the operators engaged are specially trained, and are experienced and efficient in the use of the welding system proposed to be employed.

8. Efficient supervisors of proved ability must be provided, and the proportion of supervisors to welders must be submitted for approval.

DETAILS OF CONSTRUCTION

Section 76. 1. The details of construction of the vessel and of the welds are to be submitted for approval.

2. Before welding, the surfaces to be joined must be fitted close to each other and the methods to be adopted for this purpose are to be approved.

3. All butt and edge connections are to be lapped or strapped.

4. With lapped connections the breadths of overlaps of butts and seams and the profiles of the welds are to be in accordance with the following table:

Thickness of Plate, Inches.	Width of overlap seam and butt, Inches.	Throat thickness, Inches.
.40 and under	2¼	.28
.60	2½	.38
.80	2¾	.48
1.00	3	.50

Intermediate values may be obtained by direct interpolation, and for thickness below .40 the throat thickness is to be about 70 per cent of the thickness of the plate.

5. A "full weld" extends from the edge of a plate for a distance equal to the thickness of plate to be attached, and the minimum measurement from the inner edge of plate to the surface of weld is the throat thickness given in the table above.

6. A "light closing weld" is a single run of light welding worked continuously along the edge of the plate. Such a weld may, however, be interrupted where it crosses the connection of another member of the structure.

7. An "intermittent or tack weld" has short lengths of weld which are spaced three times the length of the weld from center to center of each short length of weld. Such tack welding may vary in amount of weld between a "full weld" and a "light closing weld."

8. The general character of welds is to be in accordance with the following table:

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	Inside edge.	Outside edge.
(*a*) Butts of shell, deck and inner bottom plating	F	F
(*b*) Butts of Longitudinal girders and hatch coamings.....		
(*c*) Edges of shell, deck and inner bottom plating	L	F
(*d*) Butts and edges of bulkhead plating		
	Toe.	Heel.
(*e*) Frames to shell, reverse frames to frames and floors.....	T	L
(*f*) Beams to decks.....		
(*g*) Longitudinal continuous angles		
(*h*) Side girders, bars to shell, intercostal plates, floors and inner bottom		
(*i*) Bulkhead stiffeners		

F = full weld, L = light weld, and T = tack weld.

9. All bars required to be watertight are to have continuous welding on both flanges with tack welding at heel of bar.

10. The welded connections of beam, frame and other brackets, are to be submitted for special consideration.

11. The committee may require, when considered necessary, additional attachments beyond that specified above, and the welding of all other parts is to be to their approval.

The following firms having applied to have their systems of Electric Welding tested to ascertain whether they comply with the Tentative Regulations adopted by the Society, the applications have been complied with, and the Surveyors' reports found satisfactory by the committee:

The Alloy Welding Process, Ltd.
The British Arc Welding Co., Ltd.
The Kjellberg System.
The Quasi-Arc Co., Ltd.
The Wilson Plastic Arc System.

List of Parts Welded at Union Plant of Bethlehem Shipbuilding Corporation, Ltd.

That the shipbuilder and shipowner have taken advantage, at least, to a limited extent of the electric arc welded method for making joints can perhaps best be illustrated by giving a list of work now being done by one of our leading shipbuilders, Mr. J. J. Tynan, at the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., San Francisco, Cal.

Welding on Merchant Ships in Full or in Part

Deck rail stanchions to plating
Clips for detachable rail stanchions
Continuous railing rods (joints)
Attaching deck collars (L rings) around ventilators
Attaching deck collars (L rings) around smoke stack ventilators
Attaching cape rings around smoke stack pipes, etc
Galley fixtures to plating (attaching)
Attaching bath and other fixtures in officers' quarter
Attaching cowl supporting rings to ventilators
Bulwark rail top splicing and end fitting
Skylights over galley
(a) Engine room stairs and gratings
(b) Boiler room stairs and gratings
Attaching (a) and (b) to plating grab rods on casing
All stairs and ladders, including rail attachments
Door frames to casing, hinges, catches, hold coach hooks, etc.
Clips for attaching interior wood finish to casing
Entire screen bulkhead. Also coal chutes
Butts of W. T. and O. O. boundary bars on bulkheads or floors in double bottom
Ventilator cowls
Stacks and uptakes
Bulkheads (that are not structural parts of the ship) partition bulkheads in accommodation
Framing and supports for engine and boiler room flooring or gratings
Cargo batten cleats
Tanks (that are not structural parts)
Shaft alley escapes
Steel skylights over accommodation spaces
Engine room skylights
Grab rods on exterior and interior of deck houses
Deck houses not covering unprotected openings through weather decks
Reinforcing and protecting angles around manhole
Joints of W. T. Angle collars at frames in way of W. T. flats

List of Welding on Destroyers

1. Cocoa matting cleats on deck
2. Lashing bolts for canvas awning deck
3. Clips for jack rods on galley house
4. Clips for ram-rods
5. Lashing pads for torpedo tubes on deck
6. Clips for stanchions, engine and fire rooms
7. Boat chock on davits
8. Pipe and sockets for propeller guards
9. Clips for engine work bench
10. Sockets for hand rails
11. Cable hangers throughout boat
12. All fixture hangers throughout boat
13. Outlet box hangers throughout boat
14. Cable hooks in engine and fire room
15. Cable guards in engine and fire room
16. Battery boxes and brackets
17. Bulkhead clips for shelving, storeroom
18. Metal ceiling grounds, forward and aft quarters
19. Deck clips for battery lockers, all quarters
20. Bars to deck for metal joiner blkhd. No. 45
21. Boiler casings, corners
22. Bucket stowage, crews' wash room, galley
23. Pet cock guards, fire room
24. Miscellaneous deck clips for tanks and lockers
25. Collars on all ventilation trunks
26. Clips in paints and oils, provision, electric, galley, torpedo, for'd and aft magazine and construction stores
27. Air tight shoes to blkhd., around girder, at blkhd.
28. Trap seating, boiler rooms
29. Fuel oil tank pipe supports
30. Foundation for all discharge manifolds
31. All "T" bar clips for brackets over fuel oil tanks
32. All strainer seatings, boiler rooms
33. Clips on spare oil burner rack
34. Clips on coil racks, boiler rooms
35. Holder for boiler spare parts
36. Wire mesh under tiling in offices' WC, washroom and crews' washroom, after deck
37. Collars around deck beams in air locks to make air tight, boiler room
38. All seatings and hangers for fire extinguishers
39. Foundations and drip pans for lubrication oil tanks, boiler rooms
40. Clips on deck for transom
41. Pads on deck for mess table
42. Berth hangers for berths on frames, all quarters
43. Clips in radio rooms for furring strips
44. Berth supports to frames, all quarters
45. Clips in chart room floors
46. Flanges on ventilation pipe, crews' quarters
47. Spotting, flanges in position on main steam line, engine and fire rooms
48. Clips on gage boards to blkhd. in engine rooms
49. Brackets for gage board, fire rooms
50. Pipe hangers on blkhds. and tanks
51. Leader on deck for steering cable
52. Chocks under turbines and gear cases
53. Clips to tank top for lathe and grinding stones
54. Collars on vent recess at blkhd. under motor platform
55. All ladder clips
56. Hangers for operating rods
57. "Z" bars on blkhds.
58. Wash machine foundations, aft deck house, clips to deck only
59. Water way bars

List of Welding on Submarines

1. Angle bars to shell for blkhds. in superstructure
2. Ammunition storage boxes, all clips and butts
3. Ammunition storage boxes, all clips and butts
4. Forbes log installation trunk butts and corner
5. For'd trimming tank liners for zinc plate
6. Liners lubricating tank, for'd and aft blkhds.
7. Liners lubricating tank, battery room and C. O. C.
8. Foundation clips for ammunition boxes, locker, etc., for'd and aft battery room tank tops
9. All manhole cover foundations in tanks
10. Compass foundation C. O. C.
11. Flooring clips C. O. C.
12. Switch boxes foundation clips, for'd battery room
13. Clips under torpedo tubes
14. Foundation torpedo tubes
15. Bulkhead door butts

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16. All clips in engine room flooring supports
17. Watertight angle butts on battery cover coamings
18. Conning tower hatch, butts and hangers
19. Ventilation pipes, flanges and shell supports
20. Exhaust pipe, flanges and bulkhd. collars
21. Torpedo doors
22. Radio room, clips for tables and cable hanger
23. Periscope, mast, hoist, foundations liners, C. O. C.
24. Telescope, radio mast foundations liners, C. O. C.
25. Toilet foundation
26. Miscellaneous alterations on foundations, holes, clips, etc.
27. Clips on hatch ladders
28. Pads on tank tops and blkhds. engine room
29. Fairwater angles and butts
30. Diving and steering gear foundations
31. Wrench stowage clips, blkhds. and frames
32. Motor room foundations
33. Butts on safes and foundations
34. Liners on shell for anchors
35. Skeg plate doubling
36. Horizontal muffler supports to shell
37. Expulsion tank cradle to shell
38. Cable foundations on aft ballast tanks
39. Switch board foundations
40. Clips in motor room for'd and aft blkhds.
41. All studs in for'd and aft fuel tank manholes
42. Steps, midship well
43. Steps, fresh water tank
44. Foundations for air starting flasks
45. Bow shutters, liners on hinges
46. Duct keel rubbing plate at frame
47. Tapping bars around gun foundations on superstructure
48. Clips on conning tower for connecting conning tower sheer frames
49. Tapping bars for doors on gun sponson
50. Bar for radio tube foundation
51. Stub masts, fairwater plates
52. Gun supports, fairwater plates
53. Support under superstructure at torpedo slide
54. Support under aft battery hatch
55. Support for thwartships blkhds.
56. Bars on escape hatches
57. Tapping bars on conning tower
58. Bats around radio tube at aft end of spray shield
59. Corners of cleat foundation plates
60. Liners on shell for stub masts
61. Liners on chain trough
62. Fill in around hawse pipe
63. M. V. blister steel covering to shell doubling
64. M. V. blister shell covering protector plate
65. Oscillater foundation aft bounding bars to shell
66. Patch plate in kingston plate, duct keel drain
67. Recess blkhd., butts on shoes, midship arrangement
68. Cleat foundation, flanged plates
69. Boat stowage chocks, angles to shell
70. Ammunition scuttle, heel of angle to cover plate
71. Angles to blkhd. and shell in M. V sound room

CORROSION OF ARC WELD METAL IN SEA WATER

A. G. Bissell, of the general engineering department of the Westinghouse Electric and Manufacturing Company, while at the Puget Sound Navy Yard, had an opportunity to examine many arc welds that had been in sea water for various lengths of time. In no instance was the arc weld metal corroded any more than the surrounding plate material except where it had been used to build up rivet heads on ships' rudders. Unwelded rivet heads in this same vicinity were also badly corroded. From a careful examination of the rudder of the U. S. S. *Arkansas* it was found that both welded and unwelded rivets on the forward end were corroded while a few feet along the side of the rudder were several welded rivets, none of which showed any signs of corrosion. It was concluded at the time that the corrosion was due to the electrolytic action between the steel of the rudder and the bronze propellers, the action being concentrated at the rivet heads.

The only information which the General Electric Company has on the ability of a weld to stand corrosion is that in connection with the 12 foot cubical tank which was made for the Emergency Fleet Corporation. This tank when completed was exposed to the weather for 5 years and a piece recently cut out of the side, which included a welded joint, showed that the depth of oxidation in the weld was just the same as on the plate, giving evidence that the welded portion is not any more susceptible to corrosion from ordinary weather conditions than the plate itself. The plate was ½ inch ship plate.

WHY WELDING IS NOT MORE WIDELY ADOPTED

The reason for the relatively slow progress of the adoption of electric arc welding in ship construction is well explained by Mr. F. B. Webster, naval architect, in a paper read before one of our leading technical societies, where he states:

"Notwithstanding the advantages and merits of welding, this art has not been adopted in shipbuilding to anywhere near the extent hoped for by its advocates. To some extent this is undoubtedly due to the fact that the executives in a shipyard are more or less influenced by men who do the work, and these men are more or less uninformed about welding or prejudiced in favor of old methods. The shipowners are also very conservative when it comes to trying anything new which in their judgment might affect the safety of a ship at sea.

"The real cause, however, that is delaying the adoption of welding in the strength members of a ship, lies in the present method of design. The modern ship with its angle bars and other shapes is designed for riveting and the faying surface of most of the flanges of these bars serve no other purpose than to provide a means of riveted connection. With riveting a calking edge is, of course, necessary and the toes of the bars often serve for this purpose, but in welding the calking, as well as the connection, is in the weld. Before the art of rolling shapes was discovered, ships were entirely constructed of plates and flat bars, and the flat bars were held in place perpendicular to the plating by straps spaced at frequent intervals.

"If the strap is removed and the junction of the bar and plate welded we have a section that is as strong as an angle bar plate connection with a more symmetrical neutral axis. Where something stronger than a flat bar and plate section is required the toe of the web of a T-bar or flanged plate, or the toe of the flange of an angle bar, may be welded to the plate. This is but one indication of a type of efficient welded construction, but its importance is obvious when the amount of weight that can be saved by the omission of faying flanges and also the beveling of these flanges in the curved portions of the ship is taken into consideration.

"Another custom and prejudice to be overcome is the overlapped and strapped joint. We have seen from the tests described above that the butt joint is the strongest, both for tensile strength and alternating stresses, but in spite of this Lloyd's require the lap joint. The lap joint is not only weaker, but it is a positive menace.

"Where there is such a difference in the means of fastening as exists between welding and riveting, it is but natural to expect that the method of construction for one type is not suitable for the other. And, in spite of the fact that welding used in the construction and repair of locomotives, in the repair of marine boilers and in the construction of the all-welded vessels already built, has shown that this method of fastening is reliable, the use of welding in ship construction will not reach its proper development until the designs of ships are modified to suit its characteristics.

"Whether the future designs for the all-welded ship are along the lines indicated above or not is immaterial, but the advantages that welding possess are sure to increase its use in the marine field, and the thing most needed to hasten this development is an approved and efficient method of welded rather than riveted ship design."

In conclusion, the author wishes to express his gratitude to all those who furnished papers, data, etc., in connection with this paper, and also to Mr. H. M. Hobart, consulting engineer of the General Electric Company, Mr. W. Spraragen, secretary, division of engineers, Welding Research Committee, and to the author's son, Harold M. Ewertz, for the assistance they have given in the preparing of this paper.

Bibliography of Electric Welding

In the following bibliography the portion covering the period from 1914 to 1918 was compiled by William F. Jacob, librarian of the General Electric Company, and published in the *General Electric Review* of September, 1918; the remainder, covering the period from 1918 to 1921, was supplied by the author. The bibliography includes references to theory, various uses, methods of applications and costs.

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1918

Bowers, B. W.
Electric Arc Welding Applied to Cast Iron.
Foundry, vol. 46, pp. 158-159.
Carefully describes process of welding defective castings.

Caldwell, James.
Notes on Welding Systems.
Inst. of Engrs. and Shipbuilders, Scotland.—Trans., vol. 61, part iv, pp. 26-59, Feb.
(Abstract) Shipping, vol. 2, pp. 584-585.
(Abstract) Mech. World, vol. 63, pp. 268-269.
(Abstract) Sci. American Supp., vol. 85, p. 182.

Collins, James H.
Electric Welding in Shipbuilding.
Elec. Engng., vol. 51, pp. 43-44.
Describes use of spot welding and arc welding in shipbuilding.

Dudley, James G.
Welding Ship's Parts Together.
Inter. Marine Engng., vol. 23, pp. 359-360.
Describes method of welding ships with electric arc.

Elliott, C. A.
Welding Track Bolts in Reconstruction of Tracks in Paved Streets.
Welding Engr., vol. 3, No. 2, pp. 36, 40.
Describes electric arc welding machine and method of welding used by Pacific Elec. Rwy. Co.

Estep, H. C.
Welding Tool vs. the Sledge; How Interned German Liners Wrecked by Prussian Vandalism Were Repaired.
Iron Trade Rev., vol. 62, pp. 57-72, Jan. 3.

Fish, Thomas
Brazing vs. Welding Stellite Tips to Machine Steel Shanks.
Am. Mach., vol. 48, p. 242.
Electric welding process used by the Ready Tool Co.

Grise, Romeo A.
Electric Welding Stops Leaks in Girth Seams.
Power, vol. 47, pp. 402-403.
Leaks in the first girth seam of return tubular boilers repaired by electric welding. Success of electric welding over oxy-acetylene.

Guerner, Jean
La Soudure Électrique et son État Actuel.
Revue Générale de l'Électricite, vol. 3, pp. 173-181.
Describes different processes of electric welding.—Illus.

James, H.
Comparison of Forge, Oxy-Acetylene and Electric Welding.
Machinery, vol. 24, pp. 471-472, Jan.
Gives essential factors in forge welding and their importance in the other processes.

von Keler, T. M. R.
German Electric Welding Process.
Am. Machinist, vol. 48, p. 172, Jan. 24.
Describes a new German process useful in the case of broken T-rails, Z-shaped steel and iron, and metallic pieces of irregular cross-sections.

Kennedy, R. S.
Boiler and Other Repairs by Electric Welding.
Inst. Marine Engrs.—Trans. (Paper not available.)
Discussion, Marine Engr. and Naval Architect, vol. 40, pp. 220-223.
(Abstract) Marine Engr. and Naval Architect, vol. 40, 1918, pp. 194-199.

Kennedy, R. S.
Electric Weld for Marine Repairs.
Shipping, vol. 3, No. 5, May 4, p. 14.
Discusses boiler and other repairs made by electric welding. Refers to tests made to discover tensile strength of weld and whether the process affected the neighboring material. Read before Inst. Marine Engrs.

Kenyon, O. A.
Effects of Arc on Metal in and around Electrical Weld.
Elec. Swy. Jour., vol. 51, p. 97.
Gives briefly effect of an arc upon the material adjacent to the weld.

Kopferschmidt, B.
The Welding of Carbon Tools.
Welding Engr., vol. 3, No. 5, pp. 24-25.
Describes methods used, oxy-acetylene welding, butt-welding and oxy-acetylene brazing.

McKay, T. G.
Recent Progress in Electric Welding.
Nautical Gaz., vol. 93, No. 22, June 8, pp. 4-5.
Describes resistance welding and arc welding. Tests of welded specimens.

Miller, S. W.
Some Structures in Steel Fusion Welds.
Am. Inst. Mining Engrs. Bull. 134, pp. 391-408, Feb.
Steel welds made by oxy-acetylene and electric arc processes present unusual structures. Differences between the two flames cause variations in nature of welds.
Discussion, Am. Inst. Mining Engrs. Bull., vol. 136, pp. 720-724.
(Abstract) Reactions, vol. 11, No. 1, pp. 8-11.
Iron Trade Rev., vol. 62, pp. 713-718.

Monetti, L.
La Saldatura Elettrica.
Rivista Marittima, March; pp. 256-263.
Electric welding.

Monk, E. L.
Electric Welding.
Practical Engr., London, vol. 57, Jan. 24, pp. 39-40. Feb. 21, pp. 90-91.
Describes processes of electric welding.

Oberg, E.
Welding Transformer Tanks by the Electric Arc Process.
Machinery, vol. 24, pp. 398-403, Jan.
Process used by Gen. Elec. Co., Pittsfield.
Describes method developed by the Pittsfield works of the Gen. Elec. Co.—Illus.

Schreiber, M.
Welded Rail Joints.
Elec. Rwy. Jour., vol. 51, pp. 190-192, Jan. 26.
Gives details of recent method of arc welding rail joints in Newark, N. J.

Sutton, C. R.
Advantages of Oxy-Acetylene Welding Over the Electric Process in Railroad Shop Work.
Jour. Acetylene Welding, vol. 1, pp. 284-285.
States that oxy-acetylene welded parts of locomotives stand strains where electric welds have failed.

Treat, Dean
Metal Electrode Welding.
Elec. Rwy. Jour., vol. 51, p. 665.
Shows how the electric welder helped to keep equipment in repair.
(Abstract) Paper read at the meeting of Wisconsin Elec. Association, March 28.

Treat, Dean
Metal Electrode Welding.
Elec. Traction, vol. 14, p. 212.

Work, E. L.
Handy Arc Welding Resistance.
Welding Engr., vol. 3, No. 4, p. 21.
Gives sketch of wiring diagram of an electric welder circuit.

Anonymous
Applications of Electric Welding to Railroad Shops.
Welding Engr., vol. 3, No. 2, pp. 32, 34.
Describes use of electric arc welding in railroad shops.
Extract from Elec. Arc Welding in Machinery, Dec., 1917.

Application of Electric Arc Welding to Shop Uses.
Canadian Foundryman, June, vol. 9, pp. 136-137.
Describes methods of electric arc welding; relative advantages and applications.

Autogenous Welding at Sayre Shops, Lehigh Valley Railroad.
Railway Rev., June 15, vol. 62, pp. 855-856.

Brass Foundry of the St. Lawrence Welding Company.
Canadian Machinery, June 20, vol. 19, p. 652.

Building Up Wheels by Electric Welder.
Electric Traction, June, vol. 14, p. 333.

Counter Attack on German Vandalism.
Marine Rev., vol. 48, pp. 47-59.
Describes repairing German ships by electric welding.

Does Striking the Arc Injure the Material?
Welding Engr., vol. 3, No. 2, pp. 26-27.
Tests carried out in the Westinghouse Works at East Pittsburgh. Tests show that the material on which the arc was struck underwent no structural change.
Comment in Welding Engr., vol. 3, No. 3, p. 27.

Electric Equipment for Steam Railroads.
Railway Age, vol. 64, pp. 897-898.
Describes use of arc welding in locomotive repair shops.

Electric Seam Welding Machine.
Iron Age, vol. 101, p. 261.
Describes machine for welding seams in sheet iron and steel by the electric resistance process.

Electric Welding in Shipbuilding.
Engr., vol. 125, p. 329.
Gives results of experimental work carried out at Portsmouth on plate connections in which riveted joints, supplemented by runs of welding and joints electric welded simply, were concerned.

Electric Welding Instead of Riveting for Shipbuilding.
Western Engng., June, vol. 9, p. 228.
Use of electric welding on bulkhead door at the N. Y. Shipbuilding Corporation yard.

Electric Welding Methods and Apparatus.
Electrical News, vol. 27, pp. 26-29.
Describes the practical features and characteristics of welding apparatus.

Electric Welding Practice on the Chicago, Rock Island and Pacific.
Railway Elec. Engr., vol. 9, p. 52.
Describes welding equipment of this road and uses made of electric welding.

Esposizione di Apparecchi per Saldatura Elettrica.
Ingegneria Italiana, May 16, vol. 1, pp. 333-335.

Homemade Arc Welding Outfit.
Coal Age, vol. 13, p. 3.
Describes simple outfit.

Improved Electric Welding.
Sci. American, vol. 118, p. 204.
Brief description of fusion process.

Innovations in Electric Welding.
Elec. Rev., vol. 72, p. 225, Feb. 9.
Briefly describes patents of Thomas E. Murray, Jr.

Instruction In Cutting For Electric Welders.
Welding Engr., vol. 3, No. 1, p. 36.
Proper instruction is necessary for efficiency and economy.

Le Macchine per la Saldatura Elettrica Ala Mostra Indetta Dall' A. E. I.
L'Industria (Milan), vol. 32, pp. 120-121, Feb. 28.

New Methods of Electric Welding.
Elec. Rev., vol. 72, p. 624.
Innovations in electric welding processes as shown by six patents.
Patents issued to T. E. Murray, Jr., and T. E. Murray.

Notes on Welding Systems.
Shipbuilding and Shipping Record, vol. 11, pp. 143-144, 176-178.
Describes briefly the nature of the several processes of electric welding.

140-Lb. Welding Outfit for Rail Bonds and Arc Welding.
Elec. Rwy. Jour., vol. 51, p. 580.
Gives operating principles and construction of the outfit.

Pacific Electric Spot Welder.
Machinery, vol. 24, pp. 757-758.
Describes machine.

Practical Test of Cast-steel Welding.
Welding Engr., vol. 3, No. 2, p. 26.
Pile cap welded together with the electric arc.

Railway Work.
Welding Engr., vol. 3, No. 2, p. 20.
Brief description of how electric arc welding was used to repair locomotive frame and fire box.

Test Electric Welding for Ships.
Power, vol. 47, p. 857.
Am. Mach., vol. 48, p. 1012.
Marine Engng. of Canada, vol. 8, p. 115.
Engng. News-Rec., vol. 80, p. 950.
Elec. Rev., vol. 72, pp. 801-802.
Elec. World, vol. 71, p. 683.
Brief report on the ship welding test being conducted by the Emergency Fleet Corporation at the Federal Shipbuilding Co. plant at Newark, N. J.

The Rivetless Ship. A Possibility.
Marine Rev., vol. 48, p. 184-185.
Describes how electric welding is being applied to shipbuilding.

The Salvaging of High-Speed Steel.
Iron Trade Rev., vol. 62, pp. 845-848.
Gives a few practical methods for conserving this material, including electric butt-welding.

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Some General Applications of Electric Welding Process.
Marine Engng. of Canada, vol. 8, pp. 94-96.
Use of electric arc welding in steel mills, railway shops, ship repairs and machine tools.
Canadian Machinery, vol. 19, pp. 187-189.
Test of Electric Welding for Steel Ships.
Metallurgical and Chemical Engng., June 15, vol. 18, p. 656.
Thompson Electric Spot Welding Machine.
Am. Mach., vol. 48, p. 170.
Describes machine.
Thomson Process of Electric Welding.
Boiler Maker, June, vol. 18, pp. 18-19.
Welding Cast Iron with the Electric Arc.
The Railway Age, vol. 64, pp. 1247-1249.
Describes work done by New York Central. Methods indicate that no break is too complicated for repair.
Welding Helps the Navy.
Welding Engr., vol. 3, Jan., pp. 19-21.
Welding the Fabricated Ship.
Elec. Rev., vol. 72, p. 1000.
Welding Locomotive Frames.
Canadian Machinery, vol. 9, pp. 652-653.
Welding Ships Electrically.
Welding Engr., vol. 3, No. 4, pp. 23-24.
Describes how electric welding process is to be applied in hull construction. Keel of vessel will be put together by spot welding and made watertight by arc welding.

1917

Armstrong, P. A. E.
The Efficiency of Arc Welding.
Welding Engr., vol. 2, Jan., pp. 41-48.
Important paper.
Armstrong, P. A. E.
Welds: The Weaknesses and Merits of Their Structure
Power, vol. 45, pp. 856-860, June 26.
(Abstract) Welding Engr., vol. 2, Sept., pp. 22-26.
Important article taking up microstructure.
Discusses electric welding.
Baltes, H. A.
Repairing a Large Casting by Electric Arc Welding.
Foundry, vol. 45, pp. 120-121, March.
Bowers, B. W.
Repairing Cracks in Steel Castings Electrically.
Foundry, vol. 45, p. 306, Aug.
Clarke, R. R.
Electric Arc Welding for Foundry Purposes.
Foundry, vol. 45, pp. 179-182, May.
Cram, R. C.
Arc Welding Rails to a Bridge.
Elec. Rwy. Jour., vol. 49, pp. 444-445, Mar. 10.
Short article shows how spot welding supplants riveting.
Cravens, G. W.
Electric Arc Welding.
Welding Engr., vol. 2, Jan., pp. 37-38.
Address before Am. Soc. of Refrig. Engrs.
Dunfee, Sherman
Arc Welding Engine Frames.
Welding Engr., vol. 2, July, p. 32.
Letter to editor.
Dyer, A. F.
Oxy-Acetylene and Electric Welding and Cutting Processes in Locomotive Works.
Canadian Railway Club Proc., vol. 16, pp. 18-37, Dec.
(Abstract) Engng. and Contracting, vol. 49, pp. 93-94. Jan. 23, 1918.
Findlay, R. H.
Economical and Effective Method of Repairing Old Rail Joints.
Elec. Rwy. Jour., vol. 49, p. 832, May 5.
Arc welding used to fasten supports to rails.
Haas, L.
Useful Data for Spot Welding Work.
Am. Machinist, vol. 47, pp. 837-840, Nov. 15.
Hackett, Albert E.
Electric Spot Welding.
Welding Engr., vol. 2, Jan., pp. 19-24.
Hamilton, D. T.
Electric Riveting.
Machinery, vol. 23, pp. 780-781, May.
Modified spot welder used to fasten rivets.
Hamilton, D. T.
Electric Seam Welding.
Machinery, vol. 23, pp. 415-519, Jan.
Describes the Toledo and Thomson machines.
Hill, M. F.
Casting Ships of Steel; Use of Electric Welded Hull Castings Suggested.
Iron Age, vol. 99, pp. 1440, 1564, June 14-28.
Discussion: I. Oesterreicher, in vol. 100, p. 230 b, July 26.
Discussion: M. F. Hill, in vol. 100, p. 348, Aug. 9.
Hills, George
General Welding Repairs in the Railroad Shop.
Welding Engr., vol. 2, Feb., pp. 35-37.
Hollup, Charles S.
Welded Containers.
Welding Engr., vol. 2, July, pp. 22-28.
Paper before Am. Soc. of Refrig. Engrs.
Discusses types of welding.
Hollup, Charles
Welding.
Welding Engr., vol. 2, Jan., pp. 36-37.
Hollup, Charles
Welding.
Am. Soc. Refrig. Engrs. Jour., vol. 4, pp. 235-268, Nov.
General paper.
Jessop, E. P.
Repairing German Vandalism by Electric Welding.
Am. Soc. Naval Engrs., vol. 29, pp. 639-653, Nov.
(Abstract) Iron Age, vol. 101, pp. 50-54, Jan. 3, 1918.
(Abstract) Inter. Marine Eng., vol. 23, pp. 122-127, March, 1918.
Very detailed account of the work.
Kearney, G.
Metal Cutting With the Electric Arc.
Gen. Elec. Rev., vol. 20, pp. 876-880, Nov.
Kenyon, O. A.
Heat Production in the Electric Arc.
Welding Engr., vol. 2, Dec., pp. 21-22.
Discussion by S. W. Miller, vol. 3, Feb., 1918, pp. 25-26.
Discussion by Arc Welding Machine Co., vol. 3, March, 1918, pp. 25-26.
Kinkead, R. E.
An Improved Method of Welding Overhead with Electric Arc Process.
Welding Engr., vol. 2, Oct., pp. 30-31.
Kinkead, Robert E.
Welding Cast Iron with the Electric Arc.
Welding Engr., vol. 2, Dec., p. 27.
Knox, H. G.
Welding Main Engine Cylinders, German Ships, "Neckar," "Rhein" and "Bulgaria," 1917.
Am. Soc. Naval Engrs. Jour., vol. 29, pp. 655-660.
(Abstract) Marine Engr. and Naval Architect, vol. 40, pp. 115-117.
Describes repairs made by arc and acetylene welding.
Mawson, R.
Arc Welding on Malleable Iron.
Am. Machinist, vol. 46, p. 219, Feb. 1.
Mawson, R.
Electric Arc Welding in the Pennsylvania Railroad Shops.
Am. Machinist, vol. 46, pp. 635-637, April 12.
Mawson, R.
Electric Arc Welding on Automobile Parts.
Am. Machinist, vol. 46, pp. 587-588, April 5.
Mawson, R.
Using the Electric Welder on Parts for Automobiles.
Am. Machinist, vol. 46, pp. 405-406, March 6.
Spot welder used.
Mawson, R.
Electric Welding in the Manufacture of a Safe Cabinet.
Am. Machinist, vol. 46, pp. 674-676, April 19.
Oberg, E.
Electric Arc Welding.
Machinery, vol. 24, pp. 285-303, Dec.
(Abstract) Welding Engr., vol. 33, Feb., 1918, pp. 32-34.
Important and exhaustive article.
Saussure, F. G. de
Information on Arc Welding.
Rwy. Mech. Engr., vol. 91, pp. 95-97, 156-158, Feb., March.
Effect of varying current on the structure efficiency of heat utilization.
Scott, J. M.
Welded Compromise Tract Joints.
Electric Rwy. Jour., vol. 50, pp. 682-683, Oct. 13.
Electric welding found satisfactory.
Sturman, T. E.
Cutting Scraps.
Welding Engr., vol. 2, Aug., p. 25.
Letter to editor stating that electric arc is best.
Truitt, D. B.
Arc Welding in Steel Foundries.
Welding Engr., vol. 2, Oct., pp. 31-33.
Truitt, D. B.
The Electric Arc in the Shipyard.
Welding Engr., vol. 2, Dec., pp. 32-33.
Unland, H. L.
Electric Arc Welding.
Gen. Elec. Rev., vol. 20, pp. 509-516, June.
Wanamaker, E.
Electric Arc Welding on the Rock Island Lines.
Rwy. Rev., vol. 61, pp. 410-413, Oct. 6.
Rwy. Mech. Engr., vol. 91, pp. 593-595, Oct.
Rwy. Age Gaz., vol. 63, pp. 753-755, Oct. 26.
Tables of operations showing actual economics effected.
Wanamaker, E.
Electric Welding Instructions.
Rwy. Mech. Engr., vol. 91, p. 644, Nov.
Wanamaker, E.
Electric Welding on the Rock Island.
Rwy. Mech. Engr., vol. 91, pp. 307-308, June.
Describes equipment.
Wanamaker, E.
War and Welding.
Welding Engr., vol. 2, pp. 22-27, Oct.
Discusses arc and electric welding and gives cost.
Wildt, E. A.
Pencil Electrode Method of Welding for Boiler Joints.
Am. Soc. Mech. Engrs. Jour., vol. 39, pp. 313-314, April.
(Abstract) Iron Age, vol. 99, p. 837, April 15.
(Abstract) Welding Engr., vol. 2, June, p. 33.
Discussion in Am. Soc. Mech. Engrs. Jour., vol. 39, pp. 314-317, 427-428, April, May.
Wilson, D.
Repairing German Ships by Electric Welding.
Iron Age, vol. 100, pp. 1132-1133, Nov. 8.
Discussion by O. A. Kenyon in Iron Age, vol. 100, pp. 1398-1399, Dec. 6.
Anonymous
A Few Applications for Arc Welding.
Welding Engr., vol. 2, Feb., 1917, pp. 21-22.
Adaptability of Spot and Butt Welding.
Welding Engr., vol. 2, Feb., p. 44.
Application of Electric Arc Welding to Machine Shop Uses.
Can. Machinery, vol. 18, pp. 583-585.
Describes two methods of electric arc welding and their relative advantages and uses.
Arc Welding Locomotive Cylinders.
Welding Engr., vol. 2, July, pp. 31-32.
Letter to editor.
Bond Welding Costs and Practices at Springfield and Worcester.
Elec. Rwy. Jour., vol. 50, p. 100, Dec. 1.
Does Striking the Arc in Electric Welding Injure the Material?
Elec. Rev., vol. 71, p. 1077, Dec. 22.
(Abstract) Elec. Rwy. Jour., vol. 50, p. 1130, Dec. 22.
(Abstract) Welding Engr., vol. 3, Feb., 1918, pp. 26-27.
Discussion in Elec. Rwy. Jour., vol. 51, p. 97, Jan. 12, 1918.
Discussion in Elec. Rev., vol. 72, p. 371, March 2, 1918.
Discussion in Welding Engr., vol. 3, March, 1918, p. 27.
Economizing High-speed Steel With the Electric Butt Welder.
Am. Machinist, vol. 47, pp. 291-292, Aug. 16.
(Abstract) Met. and Chem. Engng., vol. 17, p. 436, Oct. 1.
Electric Arc Welding.
Welding Engr., vol. 2, June, pp. 22-23.
Electric Spot Welding Operations on Automobile Lamps.
Am. Machinist, vol. 46, pp. 1029-1030, June 14.
Welding Engr., vol. 2, July, pp. 19-20.

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Electric Welder in Stove Making.
Am. Machinist, vol. 47, pp. 235-236, Aug. 9.
Electric Welding Operations at the Studebaker Plant.
Am. Machinist, vol. 46, pp. 1119-1120, June 28.
Electric Welding Operations on Automobile Parts.
Am. Machinist, vol. 46, pp. 909-910, May 24.
Good Results From Electric Bonding Machine.
Elec. Rway. Jour., vol. 50, pp. 25-26, July 7.
Liliputian Outfit for Welding Rail Bonds.
Sci. American, vol. 117, p. 387, Nov. 24.
Small portable device.
Manufacturing Lockers and Cupboard With the Spot Welder.
Am. Machinist, vol. 46, pp. 1067-1069, June 21.
Old Angle Bars Reclaimed by Electric Welding.
Elec. Rway. Jour., vol. 49, pp. 352-353.
Spot Welding at the Chalmers Plant.
Am. Machinist, vol. 47, pp. 421-422, Sept. 6.
Welding and Reinforcing by the Electric, Oxy-Acetylene, or Other Processes.
Inter. Marine Engng., vol. 22, pp. 439-440, Oct.
Rules prescribed by the U. S. Board of Supervising Inspectors.
Welding by the Electric Arc Process.
Rway. Rev., vol. 60, pp. 489-491, April 7.
Welding Operations on Automobile Bodies.
Am. Machinist, vol. 46, p. 930, May 31.

1916

Armstrong, P. A. E.
Manganese Steel Welding.
Elec. Rwy. Jour., vol. 47, pp. 1144-1146, June 17.
Blacklock, J. B.
Reducing the Base of a Gear by Means of the Electric Arc.
Elec. Rwy. Jour., vol. 47, pp. 369-370, Feb. 19.
Bryan, J. H.
Progress in Electric Welding, With Cost Table.
Boiler Maker, vol. 16, pp. 35-37, Feb.
(Abstract) Rwy. Mech. Engr., vol. 90, p. 204, April.
States that practically every large railroad shop in the U. S. uses the electric arc.
Cravens, George M.
Electric Welding in Boiler and Tank Shops.
Boiler Maker, vol. 16, pp. 43-46, Feb.
Gives tests and costs.
Fox, G.
Electric Welding in Railroad Shops.
Rwy. Mech. Engr., vol. 90, pp. 591-595, Nov.
Hamilton, D. T.
Electric Spot Welding.
Machinery, vol. 22, pp. 1046-1051, Aug.
Machinery, vol. 23, pp. 24-31, Sept.
Hinckley, G. C.
Will Electric Welding Supplant Riveting in Fabricating Structural Steel?
Engng. Rec., vol. 74, p. 524, Oct. 28.
Welding Engr., vol. 2, Feb., 1917, pp. 41-44.
Author favors welding and suggests tests.
Hoffman, E. A.
Arc Welded Track Joints.
Elec. Rwy. Jour., vol. 48, pp. 1244-1245, Dec. 16.
Ingham, W.
A Few Notes on Repairing a Large Valve Chamber by the Quasi-Arc System.
South African Inst. of Engrs. Jour., vol. 15, pp. 29-32, Sept.
Kinkead, R. E.
Electric Arc Welding in Locomotive Repair Shops.
Rwy. Rev., vol. 59, pp. 871-872, Dec. 23.
Gives costs of welded repairs.
Parsons, R. H.
Electric Arc Welding.
Elec. Traction, vol. 12, pp. 109-112, Feb.
Shows how arc welding can be applied to repair work.
Ray, T. B.
Repairing Electric Locomotive Resistance Grids.
Elec. Rwy. Jour., vol. 47, pp. 322-324.
Costs of repairs by electric arc.
Sauer, Julius
Electric Welding.
Electn., London, vol. 77, pp. 75-76, April 21.
Abstracted from Elektrotech. Zeit.
Seede, J. A.
Electric Arc Welding Finds Many Uses in Mines and Mills.
Mining and Engng. World, vol. 45, pp. 133-136, July 22.
Warren, F.
Welding High-speed Steel Electrically.
Machinery, vol. 22, pp. 789-790, May.
Anonymous
Comparative Costs Between Acetylene and Arc Weldings.
Elec. Rev. and Western Electn., vol. 68, p. 71, Jan. 8.
Cost of Electric Welding in Railroad Shops.
Elec. Rev. and Western Electn., vol. 68, p. 241, Feb. 5.
Details of costs and comparison with old systems of welding.
Cost of Electric Welding in Railroad Shop Repair Work.
Elec. World, vol. 68, p. 960, Nov. 11.
Compilation of data by Westinghouse Co.
Electric Arc Welding; Report of a Committee of the Assn. of Rwy. Elec. Engrs.
Rwy. Rev., vol. 59, pp. 768-771, Dec. 2.
(Abstract) Power, vol. 44, pp. 766-767, Nov. 28.
(Abstract) Rwy. Mech. Engr., vol. 91, pp. 41-43, Jan.
Gives current consumption and costs.
Electric Welding in Boiler Repairs.
Rwy. Mech. Engr., vol. 90, pp. 312-313, June.
Rwy. Age Gaz., vol. 60, pp. 1185-1186, June 2.
Making Railway Rails Continuous by Means of the Electric Arc.
Sci. American, vol. 114, pp. 617, 626-627, June 10.
Notes on Electric Welding.
Elec. Rev., London, vol. 78, pp. 91-92, 132-133, 183-184, 211-212, Jan. 21, Feb. 4-18.
Very extensive descriptive series.
Quasi-Arc Welding System.
Commonwealth Engr., vol. 4, pp. 49-51, Sept.
Description of the system, using special electrodes.
Symposium on Welding as Applied to Boilers.
Power, vol. 43, pp. 724-725, May 23.
Opinions of prominent men on electric and gas welding.
Unusual Electric Butt Welding.
Machinery, vol. 23, p. 20, Sept.
Butt-welding used to join ends of pins together.
Use of Slag-coated Electrodes and Polarity Reversal in Electric Welding.
Elec. Rwy. Jour., vol. 48, pp. 1028-1029, Nov. 11.
Permits the use of larger electrodes.
Welding High-speed Steel Blocks to Tool Steel Shanks.
Machinery, vol. 22, p. 979, July.
Gives advice as to what kind of machines to use.
Welding Manganese Steel.
Elec. Rwy. Jour., vol. 48, pp. 27-28, July 1.
A discussion and continuation of Mr. Armstrong's paper listed above.

1915

Auel, C. B.
Electric Welding.
Trans. Inter. Engng. Congress, Paper No. 136.
Elec. Engng. vol., pp. 61-104.
Iron Age, vol. 96, pp. 1356-1359, 1414-1416, Dec. 9-16.
(Abstract) Power, vol. 43, pp. 30-32, Jan. 4.
(Abstract) Electn., London, vol. 76, pp. 45-48, 84-86, Oct. 15-22.
Important article.
Bryan, J. H.
Electric Welding: The Various Methods in Use
Engrs. Club of Philadelphia, Proc., vol. 32, pp. 229-269, July.
(Abstract) Sci. American Suppl., vol. 80, pp. 382-384, Dec. 11.
Bullard, J. E.
Electric Welding.
Boiler Maker, vol. 15, pp. 72-73, March.
Cravens, George W.
Electric Arc Welding in Boiler Shops.
Boiler Maker, vol. 15, pp. 33-36, Feb.
Gives tests of strength and costs of repairs.
Cravens, George W.
Electric Arc Welding in Steam Railroad Shops
Proc. Southern and Southwestern Rwy. Club, Jan.
(Abstract) Engng. News, vol. 73, p. 1084, June 3.
Give costs.
Durie, D.
Electric Welding with Dynamotor Sets.
Elec. Rwy. Jour., vol. 46, p. 324, Aug. 21.
Fox, G.
Electric Welding.
Elec. Rev. and Western Electn., vol. 67, pp. 117-119, 156-159, 204-206, July 17-31.
Hamilton, Douglas T.
Electric Butt Welding Development.
Machinery, vol. 21, pp. 439-444, Feb.
Hamilton, D. T.
Electric Butt Welding Process.
Machinery, vol. 21, pp. 562-565, 660-663, 735-739, March-May.
Hamilton, D. T.
Percussive Electric Welding.
Machinery, vol. 21, pp. 807-812, June.
(Abstract) Sci. American Suppl., vol. 80, pp. 396-398, Dec. 18.
Kicklighter, Charles H.
Electric Welding of Commercial Plate.
Mechanical World, vol. 58, pp. 153-154, Sept. 24.
Explains how welding supplants riveting.
Kinkead, Robert E.
Electric Arc in the Foundry.
Am. Foundrymen's Assn.
Paper read before the Sept. 30 meeting.
Lasher, A. C.
How a Water-Tube Boiler was Repaired by an Electric Weld.
Elec. World, vol. 66, pp. 1207-1208, Nov. 27.
Lincoln, J. F.
Answers to Some Questions on Electric Arc Welding
Am. Inst. of Elec. Engrs. Proc., vol. 34, pp. 433-438, March.
Iron Trade Rev., vol. 56, pp. 623-624, March 25.
(Abstract) Rwy. Age Gaz. (Mech. Ed.), vol. 89, p. 195, April.
(Abstract) Mech. Engr., vol. 35, p. 321, April 23.
Discussion of above paper in Am. Inst. of Elec. Engrs. Proc., vol. 34, pp. 2941-2946, Dec.
Lincoln, J. F.
Arc Welding and Its Application in the Metal-working Industry.
Foundry, vol. 43, pp. 139-140, April.
Iron Age, vol. 95, p. 949, April 29.
Elec. Rev., and Western Electn., vol. 66, pp. 1161-1162, June 19.
Marquand, H. S.
Modern Methods of Electric Welding and Their Application.
Inst. of Elec. Engrs. Jour., vol. 53, pp. 851-856, June 15.
McDowell, C. S.
Electric Arc Welding.
Jour. Am. Soc. Naval Engrs., vol. 27, pp. 629-639, Aug.
Very complete analysis.
Randolph, J. A.
Modern Practice in Electrical Arc Welding.
Foundry, vol. 43, pp. 316-317, Aug.
Iron Trade Review, vol. 57, pp. 490-491, Sept. 9.
Seede, J. A.
Electric Arc Welding: Its Use in the Shop.
Boiler Maker, vol. 15, pp. 39-41, Feb.
Zuck, E. S.
Electric Arc Welding in Mine Repair Shops.
Coal Age, vol. 7, pp. 326-330, Feb. 20.
Anonymous
Electric and Oxy-Acetylene Welding.
Inter. Marine Eng., vol. 20, pp. 564-565, Dec.
Attention called to the necessity of using skilled operators
Electric Welding at Brighton Works: London, Brighton and South Coast Railway.
Rwy. Gaz., London, vol. 22, pp. 139-140, Feb. 5.
Use of quasi-arc system in repair work.
Electric Welding in Boiler Maintenance: Report of Committee of Master Boiler Makers Assn.
Master Boiler Makers Assn. Proc.
Rwy. Age Gaz. (Mech. Ed.) vol. 89, pp. 312-313, June.
Rwy. Age Gaz., vol. 58, pp. 1166-1167, June 4.
Discusses advantages and disadvantages of electric welding for boiler maintenance and repairs.
Master Blacksmiths' Convention; Discussion of Electric Welding.
Rwy. Age Gaz. (Mech Ed.), vol. 89, pp. 476-480, Sept.
Gives economy in railroad shops.

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Thomson Electric Welding Patents Upheld.
Elec. World, vol. 66, pp. 851-852, Oct. 16.
Welding: Present Status of the Art, with References to Recent Articles.
Sibley Jour., vol. 29, pp. 197-198, March.
Short article.

1914

Bennett, A. M.
Application of the Carbon and Metallic Arc in Cutting and Welding.
Machinery, vol. 20, pp. 927-930, July.
Bryan, J. H.
Electric Arc Welding.
Western Rwy. Club Proc., Nov. 17.
(Abstract) Rwy. Age Gaz., vol. 57, pp. 951-953, Nov. 20.
(Abstract) Rwy. Rev., vol. 56, p. 187, Feb. 6, 1915.
Gives costs in railroad work.
Green, V. D.
Low-pressure Electric Welding Machines.
Engng. Mag., vol. 48, pp. 178-186, Nov.
Heaton, T. T.
Modern Methods of Welding.
Inst. Mech. Engrs. Proc., pp. 151-200, Feb.
Engng., London, vol. 97, pp. 300-303, Feb. 27.
Engr., London, vol. 117, pp. 247-248, Feb. 27.
Mech. Engr., vol. 33, pp. 201-203, Feb. 27.
(Abstract) Iron Age, vol. 93, pp. 676-677, March 12.
(Abstract) Am. Soc. Mech. Engrs. Jour., vol. 36, pp. 91-92, April.
(Abstract) Industrial Engng., vol. 14, pp. 171-172, April.
(Abstract) Rwy. Age Gaz. (Mech. Ed.), vol. 88, pp. 200, April.
Discussion of above paper in Engr., London, vol. 117, pp. 239-240, Feb. 27.
Important article discussing electric and other methods.
Hodges, W. A.
Electric Resistance Process of Welding and Heating.
Am. Soc. Mech. Engrs. Jour., vol. 36, pp. 217-219, June.
Hogan, J. P.
Reinforcing Ruptured Concrete Lining in High Pressure (Catskill) Aqueduct Tunnel.
Engng. Rec., vol. 69, pp. 240-243, Feb. 28.
Describes how reinforcing rings were electrically welded.
Kenyon, O. A.
Electric Arc Welding.
Elec. World, vol. 63, pp. 705-707, March 28.
Industrial Engng., vol. 14, pp. 218-219, May.
Utilization of the carbon arc to raise metals to be welded to melting temperature. Description of methods and application.
Parsons, R. H.
New Uses for Electric Arc Welding.
Elec. Rwy. Jour., vol. 43, p. 482, Feb. 28.
Application to railroad repair work.
Price, E. C.
Repairs and Welds of Track and Rolling Stock by Electricity.
Elec. Rwy. Jour., vol. 43, pp. 471-472, Feb. 28.
Skinner, C. E. and Chubb, L. W.
New Electric Welding Process—Electro-Percussive System.
Am. Electrochem. Soc. Trans., vol. 26, pp. 149-161.
(Abstract) in Electn., vol. 75, pp. 5-6, April 9, 1915.
(Abstract) Met. and Chem. Eng., vol. 12, 713-714, Nov.
(Abstract) Elec. Rev., London, vol. 75, p. 666, Nov. 13.
(Abstract) Elec. World, vol. 64, p. 766, Oct. 17.
Smith, H. Sidney.
Fusion or Autogenous Welding.
Soc. Auto. Engrs. Bul., vol. 6, pp. 445-459, Sept.
Horseless Age, vol. 34, pp. 666-668, Oct. 28.
Horseless Age, vol. 34, pp. 695-697, Nov. 4.
Considers electric and blowpipe welding and favors the latter.
Venning, F. J.
Electric Welding in Track Repairs.
Elec. Rwy. Jour., vol. 44, pp. 769-771, Oct. 10.
Whiteford, A. W.
Cutting and Welding Devices in Railroad Work.
Boiler Maker, vol. 14, pp. 237-239, Aug.
General article, read before New England R. R. Club.
Zuck, E. S.
Equipment for Electric Arc Welding.
Elec. Jour., vol. 11, pp. 565-569, Oct.
Gives figures on economy.
Zuck, E. S.
Some Applications of Electric Arc Welding.
Elec. Jour., vol. 11, pp. 37-40, Jan.
Anonymous.
Automatically Welded Electric Joints in Brooklyn.
Elec. Rwy. Jour., vol. 44, p. 1310, Dec. 12.
Describes application of a portable welder of the Atlantic Welding Corp. and shows photo-micrographs.
Electric Welded Joint and Rail Brace Used in Cincinnati.
Elec. Rwy. Jour., vol. 43, p. 1467, June 27.
Electric Welding at the Angus Shops of the Canadian Pacific.
Rwy. Age Gaz. (Mech. Ed.), vol. 88, pp. 321-322, June.
Gives costs.
Experiences in Electric and Autogenous Welding of Steam Boilers.
Zeit. f. Dampfkessel und Maschinenbetrieb, vol. 37, p. 303, June 19. (In German.)
(Abstract) Am. Soc. Mech. Engrs. Jour., vol. 32, pp. 212-213, Nov.
Slight advantage for electric welding on account of more limited local heating.
New Arc Welding Machine
Machinery, vol. 20, p. 1005, July.
Describes A. E. G. system using Kramer type of welding dynamo. Wiring diagram and curves given.
Oxy-Acetylene and Electric Welding.
Rwy. Age Gaz., vol. 56, pp. 1188-1189, May 29.
(Abstract) Rwy. Age Gaz. (Mech. Ed.), vol. 88, pp. 314-316, June.
Report and discussion before Master Boiler Makers' Assn.: Concludes that electric arc is better for welding while the gas flame is better for cutting.

BOOKS

1918

Kehl, Robert J.
Oxy-Acetylene Welding Practice.
Chicago. Am. Tech. Soc., pp. 11-14.
Electric welding process, and illustration of portable arc welding outfit.

Wilson Welder and Metals Co.
Electric Arc Welding and Cutting.
New York, Wilson Welder and Metals Co., 45 pp.
Manual of Instruction for installation and operation of equipment; describes the Wilson system of welding; contains much valuable data.

1917

Burgess, C. F., and Cravens, G. W.
Applied Electro-Chemistry and Welding.
Chicago. Am. Tech. Soc.
Oberg, E. (Ed.)
Machinery's Encyclopedia.
Vol. I, p. 88, Electric Welding of Aluminum.
Vol. IV, p. 5, Electric Welding of High-speed Steel.
Vol. VI, pp. 483-502, Electric Welding.
New York. Industrial Press.

1916

Wilcox, E. A.
Electric Heating.
pp. 197-213, Electric Welding.
San Francisco. Technical Publishing Co.
Gives time and cost of electric welding.
Marks, Lionel S.
Mechanical Engineers' Handbook.
pp. 1409-1412, Electric Welding.
New York. McGraw-Hill Book Co.
Manly, Harold P.
Oxy-Acetylene Welding and Cutting, Electric Forge and Thermit Welding.
pp. 142-169, Electric Welding.
Chicago. Fred J. Drake.
Wilson Welder and Metals Co.
Electric Welding.
New York. Wilson and Metals Co., 63 pp.
Describes the Wilson system of welding.
Hawkins and his staff.
Hawkins Electrical Guide No. 10.
pp. 3122-3132.
New York. Audel & Company.
Elementary question-and-answer article describing methods in use.

1915

Richey, A. S.
Electric Railway Handbook.
pp. 60-61, Electric Welding.
New York. McGraw-Hill Book Co.
Kenyon, Otis A.
Standard Handbook for Electrical Engineers; Section on Electric Welding.
pp. 1727-1733.
New York. McGraw-Hill Book Co.
Escard, Jean.
La Soudure Electrothermique (in French)
Reprint from L'Ouvrier Moderne, of April 15.
Cravens, G. W.
Welding: Instruction Paper.
pp. 32-67, Electric Arc Welding and Cutting.
pp. 67-93, Electric Butt Welding.
p. 53, Mentions Quasi-Arc System.
Chicago. American School of Correspondence.
Gives current consumption and costs.

The following items were added by the author:

1918

Caldwell, James
Report to the U. S. Shipping Board—on electric welding and its applications in the United States to ship construction.
General Electric Review for December, 1918.
Entire issue is devoted to the subject of electric welding.
Rigby, E. J.
Covered Electrode Process.
Journal Engineers Club of Philadelphia, vol. 35, pp. 472 to 482, October, 1918.

1919

Eschholz, O. H.
Fusion in Arc Welding.
Proc. of the Am. Inst. Elec. Engrs., vol. 38, pp. 319 to 327, March, 1919.
Adams, C. A.
Electric Welding as Applied to Shipbuilding.
Journal of the Western Society of Engineers, vol. 24, pp. 119 to 127, March, 1919.
Caldwell, J., and Sayers, H. B.
Electric Welding Developments in Great Britain and the United States of America. (Paper read on March 11, 1919.)
Minutes of the Proceedings of the Institution of Civil Engineers, vol. 208, Part 2.
Abell, W. S.
Experiments on the Application of Electric Welding to Large Structures. (Paper read on March 11, 1919.)
Minutes of the Proceedings of the Institution of Civil Engineers, vol. 208, Part 2.
Hobart, H. M.
Welding Mild Steel.
Proc. of the A. I. E. E., vol. 38, pp. 561 to 609.
Kjellberg, O.
Electric Welding and Its Application to Shipbuilding.
Engineer, London, vol. 128, pp. 442-444, 472-473, October 31, November 7, 1919.
Gard, W. H
Electric Welding in Warships.
Marine Engineer and Naval Architect, vol. 41, pp. 238-244, May, 1919.

1920

Eschholz, O. H.
Metallic Electrode Arc-welding Process.
Mechanical Engineering, vol. 42, pp. 572-574, Oct., 1920.
Spraragen, W.
Speed of Metal Arc Welding.
Welding Engr., vol. 5, pp. 44-47, June, 1920.

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Questions and Answers Relating to Naval Architecture and Marine Engineering

Conducted by James L. Bates, Naval Architect, and W. B. Newton, Marine Engineer

This department is maintained for the purpose of answering all questions relating to ships and their machinery. All inquiries should bear the name and address of the writer. Anonymous communications will not be considered. The identity of the writer, however, will not be disclosed unless the editor is given permission to do so.

Power-Tonnage Classification of Merchant Vessels

Q. (1,233).—Would you kindly furnish me a complete list of different classes of vessels from Classes A to E, and the required power tonnage of both single and twin screw ships of these classes.—G. F. D.

A. (1,233).—It is assumed that you refer to the power-tonnage of the five different classes adopted for the comparison of merchant vessels and not to the power-tonnage of the individual vessels covered by each of these classes. The following is taken from page 24 of "Standard Seamanship for the Merchant Service" by Felix Riesenberg, C. E. (D. Van Nostrand Company, 1922).

"Vessels are classed according to their 'power-tonnage,' represented by gross tonnage plus indicated horsepower as given in the latest 'List of Merchant Vessels of the United States' compiled by the Commissioner of Navigation.

Power-Tons (Figures are inclusive)

Classes	*Single Screws*	*Twin Screws*
A	Over 20,001	Over 15,001
B	12,001 to 20,000	9,001 to 15,000
C	7,501 to 12,000	5,501 to 9,000
D	5,001 to 7,500	3,501 to 5,500
E	Below 5,001	Below 3,501"

Corrosion of Condenser Tubes

Q. (1,234).—What are the causes of corrosion or dezincification of condenser ferrules and tubes, when running in salt water, as the North Atlantic?

Which is the better preventative—zinc plates or iron plates, introduced into the water end of the condensers; where is the best place to attach them, on the tube sheets or condenser doors?

Is the "electrolytic" system of preventing corrosion a success, and what is its principle of action? Is this a costly apparatus, and from whom can it be obtained?

What is the best kind of packing for condenser tubes, and should cotton cord packing be put in dry or soaked in linseed oil, as is often done?

Is there any harm in using a little graphite on the threads of the ferrules? —C. R. K.

A. (1,234).—Corrosion is caused by the formation of a galvanic couple which may be brought about by the liberation of oxides which are electronegative toward the tubes or tube plate thus setting up an electric action. The combination of dissimilar metals or sudden changes in temperature or the freeing of sulphuric acid from sulphate scale all tend toward causing electric flow.

When zinc plates are used it is customary to attach them to the condenser head doors. Care must be taken that there be perfect electrical contact to produce a beneficial effect. The zinc and the composition in metallic contact in the water in the head form a battery in themselves, the zinc becoming a positive pole and though it does not prevent galvanic action it being more susceptible attracts to itself all or nearly all corrosive or galvanic action and dissolves.

Zinc is being superseded for condenser protection to a great extent by iron. This is borne out to be a step in the right direction as tests have proven that the loss in weight for cast iron when sprayed with sea water is considerably greater than for zinc during the same period of time.

The only electrolytic process for the prevention of corrosion in condensers and boilers of which I have knowledge is known as the "Cumberland Electrolytic Process." A number of years ago this apparatus was handled by the Submarine Signal Corporation, Boston, Mass., but they no longer have the agency for it. The main office of this company is in England but I have not been able to locate their American representative.

The process has been used in England for a number of years and, as I understand, is considered over there to be most successful. For some reason unknown to me it has not been very favorably received in this country.

The principle upon which the system operates depends upon the fact that if an electric current from an outside source be sent through the condenser or boiler in a contrary direction to that in which corrosion is taking place and of sufficient strength the destructive action is either neutralized or reversed. A metal electrode is suspended in the water head and connected to a battery or other source of electric power by a wire insulated from the condenser. The current is passed to the electrode and thence through the water to the condenser parts. The suspended electrode being thus made positive is corroded away and condenser corrosion ceases. It is claimed that with unlimited supplies of current from an outside source at the rate of 3 to 5 amperes per 1,000 square feet of surface and all parts properly installed and regulated, the corrosive action will practically cease.

There are two kinds of packing used for condenser tubes, corset lacing, cut in about 20-inch lengths or soft metallic packing. The corset lacing should be soaked in either boiled linseed oil, melted tallow or beeswax. The relative effectiveness of the agent in which the packing be soaked is given in the order named.

Metallic packing is more difficult to install properly as to internal leaks but will remain tight much longer than lacing. Should by any chance the condenser become overheated, the metallic packing would not be affected but in the case of lacing the oil or grease might boil out and many leaks develop.

I can see no harm in using a small amount of graphite on the condenser ferrule threads as not enough would leak through to the steam side to have any injurious effect on the boilers.

Chamfering Piston Rings

Q. (1,235).—Is it good practice to chamfer the piston rings of marine engines? If so, what portion of the width and thickness should be filed off? What benefits, if any, are to be derived from chamfering of piston rings?—M. J. S.

A. (1,235).—It is customary to round off all sharp edges on piston rings with a file, just enough being removed to prevent their having a cutting effect circumferentially and their points from digging in and nipping the cylinder bore. Often on removing a piston from its cylinder, after some time in service, the rings will be found to have razor-like edges. These should be filed off just as was done when the ring was new.

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NEW BOOKS

The Sumner Line of Position

Reviewed by Charles E. Manierre

H. O. No. 203. *Size, 9 by 11½ inches. Pages, 882 (including tables). Washington, D. C., 1923: United States Hydrographic Office.*

The Hydrographic Office has recently published and put on sale the new volume H. O. No. 203. It is somewhat larger than Bowditch's American Navigator. It is a book of tables by means of which it is possible to avoid a logarithmic computation in laying down the Sumner Line from an observation. It is a notable publication and as an added convenience to the navigator it is comparable to the excellent recasting of the form of the Nautical Almanac some twelve or more years ago.

The book consists in the main of one huge table, the working of which is simplicity itself. At one opening and on one-quarter of a single line of the page is found as unknown quantities the local hour angle of the observed body and also its Azimuth. These figures as taken from the table are only modified for a tabular difference per minute of declination.

The known quantities with which the table is entered are approximate values of the declination and altitude of the observed heavenly body and the D R latitude of the ship. The table will be seen to be made up of the corresponding values of all the parts of the astronomical triangle, except the position angle, for an indefinite number of positions of bodies and latitudes of the ship within the limits of the table. There is a brief preliminary statement followed by a few pages of familiar tables incorporated for convenience and the remainder of its 869 pages is the main table. Its limits of Latitude are 60 degrees N. and 60 degrees S. and Declination 27 degrees N. and 27 degrees S.

It will be evident that it can be used in all waters much frequented by ships and the declinations covered include some twenty of the list of fifty-five navigational stars, as well as the sun, moon and planets. By interchanging latitude and declination values, the table may be used in low latitudes, viz., between 27 degrees N. and 27 degrees S. for stars whose declination is not greater than 60 degrees. This would include all but six stars of the list.

Of course, the necessary data has to be prepared in the usual way. But after that instead of a logarithmic solution and a search of the Azimuth tables, the Greenwich hour angle is combined with the local hour angle taken from the table for the longitude of the ship. An assumed point of position on the plotting is fixed by such longitude and by taking the nearest even degree of latitude to that found by dead reckoning. From this point using the Azimuth from the table, the direction of the observed body is plotted and at right angles to this line is also plotted the Sumner Line.

The Hydrographic Office or any of its sales agents can supply anyone who is interested in this book with the Pilot Chart of the North Atlantic Ocean for January, 1924. On the back of this chart will be found sample pages of H. O. No. 203 and also a problem worked by the table and a plotting of the problem. The problem, as it happens, shows two Sumner Lines resulting in a "fix" but either one of these lines fully illustrates the use of the table.

The Hydrographic Office is preparing a second volume to be known as H. O. No. 204 which will carry the table up to Latitude 60 degrees N. and 60 degrees S., thus extending the range of the table in the two volumes to include nearly all the navigational stars for latitudes lying between 60 degrees N. and 60 degrees S.

A table of this kind could only be constructed within practicable volumes by taking full advantage of the peculiarities of the St. Hilaire form of Sumner Line problem. The first of these is that the line may be moved on the plotting parallel to itself either toward or away from the observed body to correct an altitude difference, and second that the problem can be worked and the line laid down with equal accuracy from any position within some miles of the D. R. position. In the method of the table, this assumed position is the nearest even degree of latitude at the point where it is intersected by the longitude determined from the table.

This new method differs from that of de Aquino found in H. O. No. 200 in that while the de Aquino method even in its simplest form is not easily understandable by the average navigator, this method can be quickly grasped and immediately put into use with confidence. The table constitutes the working out of a somewhat intricate problem so as to permit a very simple solution.

LETTERS TO THE EDITOR

Failure of Welded Pipe Hangars

NEW YORK.

TO THE EDITORS:

In reading the article on "Applications of Arc Welding to Ship Construction" in the December issue, I wish to state for the benefit of the author, that it has come under my notice that on tankers hangers and clips of steam smothering lines in expansion trunks that have been welded but two years are continually breaking off and coming loose leaving no trace of where they were welded. Of course, these are extreme conditions but they are, nevertheless, a good test. There is no part of any ship that rusts more than an empty tank of an oil carrier; more so, if the vessel has been carrying light oil.

I would recommend that no welding be done in damp weather and I think that the edges of plates would stand up better, if they were roughened instead of clean cut. In this particular case the trouble may be due to the fact that the welding was not burnt into the plate.

THOS. F. HAGAN, marine engineer.

Diesel Drive Must Be Reckoned With

CHARLESTON, S. C.

TO THE EDITORS:

With reference to the article in the January issue concerning Diesel drive, by Mr. William J. Deed, N. A., I thoroughly agree with him. We must accept the verdict of such hard-headed shipowners as those of Great Britain, Germany and the Scandinavian countries. If we don't, we must eventually finish at the tail end of the race.

There can be no further doubt regarding the reliability of the Diesel drive. The writer having interviewed numerous engineers of motorships, finds that without exception none would return to steam unless otherwise forced to do so. From personal observations I find motorships in docking handle fully as well as a steamer, in fact, the 15,000-ton Diesel tanker *Zoppot*, while in Charleston recently, handled practically as well as a towboat.

We must, if we are to be successful, bring Diesel engines down to the Ford basis: simplicity and ruggedness must be the outstanding features. They should be on a par with the old-time three legger with all pumps on the beam, one extra feed pump and one donkey pump; and not, as is the case at the present, from 20 to 30 single cylinder condensing auxiliaries, pumps, generators, etc., using high pressure steam and requiring more upkeep than the main unit. They should

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be so simple that the average engineer can successfully operate them; for if, as the tendency seems to be, they are to have useless parts, complicated mechanisms and exceedingly high air injection pressures (when solid injection is as good), also Diesel-electric drive, high speed Diesel reduction geared drive, etc., we will have to employ a better grade of engineers; in fact, specialists not easily obtainable, who will be able to command considerable higher wages than would be the case of engineers on the simple direct slow speed drive with two or three small Diesel-electric generators for auxiliary purposes.

W. P. LAMBERT, marine superintendent,
The Carolina Company.

Application of Arc Welding to Ship Construction

(*Continued from page* 121)

Tracey, B. C.
Arc Welding in Steam Railroad Shops.
Welding Engr., vol. 5, pp. 23-27, June, 1920.
Kirkhead, R. H.
Welding Cast Iron with the Electric Arc.
Welding Engr., vol. 5, pp. 23-24, Aug., 1920.

1921

Eschholz, O. H.
Phenomena of Arc Welding.
Trans. of the American Electrochemical Society, vol. 39, pp. 59-71, April, 1921.
Eschholz, O. H.
Forging of Arc Deposited Metal and Arc Welds.
Welding Engr., vol. 6, pp. 26-29, Aug., 1921.
Farmer, F. M.
Desirability of Standardization in the Testing of Welds.
Engineering, London, vol. 111, pp. 220-222 and 239-242, 1921.
Ruder, W. E.
Science of Electric Welding.
Journal of the Franklin Institute, vol. 192, pp. 561-583, Nov., 1921.
Bonner, W. T.
Progress of Welding in the Shipyards.
Marine Engineering, vol. 26, pp. 57-65, Jan., 1921.
Candy, A. M.
Application of Arc Welding in Machinery Construction.
Electrical Review, Chicago, vol. 79, pp. 1-5, July 2, 1921.
Wanamaker, E.
Practical Applications of the Electric Arc Welding Process.
Welding Engr., vol. 6, pp. 45-51, Nov., 1921.

BOOKS

Viall, E.
Electric Welding.
(1922) McGraw-Hill Book Co.
Carpmael, Herbert.
Electric Welding and Welding Appliances.
(1921) D. Van Nostrand Co.
Horner, Harry A.
Spot and Arc Welding.
(1920) J. B. Lippincott Co.

PERSONAL MENTION

W. D. CLARK has been appointed assistant agent at the American-Hawaiian offices, Boston, Mass., according to advices from San Francisco.

GEORGE C. CLARK has resigned as president of the New York Harbor Dry Dock Company, Inc., New York, due to the pressing demands of his many business interests.

J. J. JONES has been promoted from the sales force of the Morse Dry Dock & Repair Company, Brooklyn, N. Y., to the position of general sales manager.

HENRY E. WADE has resigned as advertising and merchandising manager of the Whitlock Cordage Company of New York, to join the staff of the Thresher Service Company of this city.

A. P. HAMMOND, formerly Pacific Coast manager for the Luckenbach Steamship Company, was recently appointed San Francisco agent for the United States & China Steamship Company of that city.

WILLIAM S. HILL, of Mitchell, S. D., president of the South Dakota State Board of Agriculture and former president of the South Dakota Farm Bureau Federation, has been appointed a member of the United States Shipping Board, vice E. P. Farley resigned.

EDWARD FORD, of W. R. Grace and Company, has been appointed general manager in charge of operations of the Pacific Mail Line.

HARRY COULBY has resigned as president of the Pittsburgh Steamship Company, the freight carrying subsidiary of the United States Steel Corporation on the Great Lakes. For the last 19 years he has combined the positions of running the fleets of Pickands, Mather & Company and of the Pittsburgh Steamship Company and is now resigning his Pittsburgh Steamship Company work to give his full time to the fleet of the Pickands, Mather & Company, known as the Interlake Steamship Company, which operates a fleet of 51 vessels having a capacity of 414,400 gross tons. Mr. Coulby will act as chairman of the board of the Pittsburgh Steamship Company, which has a fleet of 99 vessels of 808,400 tons capacity. Mr. Coulby is succeeded by A. F. Harvey as president of the Pittsburgh company, who has been vice president for a number of years.

Harry Coulby

JAMES HARTNESS, former governor of Vermont and past president of the American Society of Mechanical Engineers, was elected president of the American Engineering Council to succeed Dean Mortimer E. Cooley of the University of Michigan at the annual meeting of the Council, which was held in Washington, January 10 and 11. Addressing the Council, President Hartness declared that his administration would be characterized by efforts aiming to aid, through the engineering profession, the American people in making the best use of the nation's energies and resources. L. P. Alford of New York and Charles R. Gow of Boston were elected vice-presidents of the American Engineering Council at the same meeting. Other vice-presidents are Calvert Townley of New York, and Gardner S. Williams of Ann Arbor, Mich. Dr. H. E. Howe of Washington was re-elected treasurer, and L. W. Wallace of Washington was again chosen executive secretary.

James Hartness

K. KATSUYAMA, general manager of the New York branch of the Nippon Yusen Kaisha, has been transferred to Kobe, Japan, as general manager of that branch. He will be succeeded here by T. Ishizawa.

HARRY SKINNER, formerly president of the Skinner Shipbuilding & Dry Dock Company, of Baltimore, has been elected president of the Vulcan Iron Works, Jersey City, N. J., in place of Alfred J. Grymes, resigned, who will continue as president of the Grymes Engineering Company.

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CAPTAIN FRANK B. HOWARTH, recently in command of the *Homeric*, has been appointed commander of the White Star liner *Olympic*. Captain Howarth has been with the White Star Line 31 years and has been 22 years in command. He succeeds Captain Hugh F. David in command of the *Olympic*.

CAPTAIN HUGH F. DAVID, commander of the *Olympic*, has recently retired from active service because of ill health. Captain David joined the White Star Line as a junior officer in 1894 and received his first command in 1903. He commanded in turn the *Teutonic, Megantic, Celtic, Cedric, Belgic, Regina* and *Adriatic*. In the war he was in command of the 32,000-ton transport *Justicia* which was sunk off the north coast of Ireland after a running fight of 24 hours with a flotilla of U-boats.

REAR ADMIRAL LEIGH C. PALMER, newly appointed president of the Emergency Fleet Corporation, graduated from the United States Naval Academy in 1896. He was promoted to the rank of lieutenant junior grade in 1901; to lieutenant in 1903; lieutenant commander in 1908; commander in 1915 and rear admiral in 1916. He participated in the battle of Santiago in 1898 and served through the Cuban and Philippine naval campaigns with the Atlantic, Pacific and Asiatic fleets. In 1906 he was United States naval representative at the wedding of King Alphonso of Spain and in the same year served as naval aide to Secretary of State Root on his South American trip. In 1906 he was made gunnery officer of the U. S. S. *Vermont*, winning the battle efficiency pennant in 1908. Between the years 1909 and 1912 he was director of torpedo practice and engineering; in this same period also serving as naval aide to President Taft. In 1913 and 1914 he served as commander of the destroyers *Aylwyn* and *McDougal* and of the seventh destroyer division. During 1915 and 1916 he was executive officer of the battleship *New York* being made chief of staff of the battleship fleet in 1916 and chief of the Bureau of Navigation from August 16, 1916, until November 1, 1918, at which time he became chief of staff of the American battleship squadron in the North Sea. On April 8, 1919, he was in command of the U. S. S. *Georgia*. In this same year he was given the degree LL.D. by Wesleyan University and the order of Leopold (Belgium).

Rear-Admiral Leigh C. Palmer

He resigned from the Navy in 1920 and was engaged for a time in export and import trade with the Far East. In April, 1923, he was appointed South American representative of the Shipping Board with headquarters at Rio de Janeiro. Later he was sent to Europe to investigate shipping conditions. He now succeeds Edward P. Farley as president of the Emergency Fleet Corporation. Mr. Farley formerly combined that office with the chairmanship of the United States Shipping Board.

J. S. MILNE, chief engineer of the Todd Shipyards Corporation, sailed December 29 to undertake an inspection trip of the Todd organization in Europe. It is his intention to inspect numerous installations of Todd oil burners being installed in White Star, Canadian Pacific, P. & O., and other British liners. He will also arrange for the manufacture and sale in Europe of the Todd electric welder and make a complete investigation of the Diesel engine situation. Accompanying Mr. Milne is William H. Smith, superintendent of the Tebo plant in Brooklyn.

D. V. STRATTON has been elected president of the New York Harbor Dry Dock Company, Inc., New York. Mr. Stratton has had extensive experience in marine construction and repair work. For several years preceding the war he was engaged in general marine and dredging operations and during the shipbuilding program of the war organized a number of shipyards for production. Following this period Mr. Stratton went to Europe to assist J. E. Sheedy, vice-president of the United States Shipping Board, in a reorganization of the Shipping Board forces in Europe. During this period Mr. Stratton made an exhaustive study of the problem of ship maintenance and operation in various European maritime countries. In the course of the work he visited all of the principal shipbuilding and repair plants of Europe with a view to comparing them from the standpoint of equipment, organization and control methods with the plants of the United States. On his return to the United States he entered the organization of the Morse Dry Dock & Repair Company, Brooklyn, New York, in charge of business development. During the past two years, while associated with Mr. Morse, Mr. Stratton has made a wide circle of friends among operating and engineering managers of shipping companies having interests in the vicinity of New York harbor.

D. V. Stratton

OBITUARY

CAPT. WILLIAM F. HUMPHREY, former treasurer of the Boston Towboat Company, died recently at his home in Boston. He was one of the most widely known shipping men in New England. Capt. Humphrey was born in Dorchester, July 28, 1839. Early in his career he became a shipmaster and later director in several steamship companies. He was also at one time president of the Boston Marine Society. His connection as treasurer with the Boston Towboat Company was severed about 1908. Capt. Humphrey began his business life in the employment of the Boston Sandwich Glass Company, but his health failing he made a voyage to the West Indies in one of his father's ships. Thriving at sea he determined to follow it as a vocation, rising rapidly to the rank of captain at the age of 24 years. In 1872 he retired from the sea and engaged in the shipping business as partner of Samuel Welch & Son.

W. F. Humphrey

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The Month's Shipping and Shipbuilding News in Brief

Shipyard, Steamship and Port Activities and Other Notes of Interest in All Branches of the Marine Industries

American Marine Standards Committee Holds Annual Meeting

THE American Marine Standards Committee, representing the ship building and correlated industries and working in conjunction with the Division of Simplified Practice of the Department of Commerce to eliminate waste in the marine and allied industries by the adoption of standard practices, held its annual executive meeting in Washington on January 21, with Colonel E. A. Simmons, chairman of the executive board, presiding. Secretary Hoover, of the Department of Commerce, attended the conference and spoke briefly of the Merchant Marine's great need for constructive aid.

The meeting was made the occasion for a general conference of the executive board, the personnel of the technical and subject committees and the representatives of the American Marine Standards Committee on committees of other bodies for the discussion of the present and future programs of the organization. In opening the meeting Colonel Simmons summarized the year's activities of the organization, showing that the executive board comprises 16 members and 3 alternates, the three technical committees appointed comprise 41 members and the sixteen subject committees now formed have 90 members. As in some cases the same person serves on more than one committee the actual number of persons engaged in the activities of the organization is 98, exclusive of the secretary.

The Standards Committee has already appointed representatives to 10 outside committees and others are under consideration. The plan of organization provides for two more technical committees to cover port facilities and plant operation. So far activities have been confined to the Atlantic Coast but panels are contemplated in the Great Lakes and Pacific Coast districts.

The progress made was attributed in very large degree to the splendid assistance given by the Department of Commerce and the Shipping Board.

W. & A. Fletcher Co. Adds Brooklyn Plant to Its Repair Facilities

THE Empire Electric Welding & Repair Company, foot of Thirty-sixth street, Brooklyn, was taken over by the W. & A. Fletcher Company, at Hoboken, N. J., for active operation as a ship repair yard on January 1. L. A. Noble, who has been with the Fletcher Company at Hoboken for some time, is general manager of the Brooklyn plant, which will be operated as a ship repair yard.

The Brooklyn acquisition will greatly augment the ship repair facilities of the Fletcher Company, as the new plant comprises fully equipped machine, plate, blacksmith, joiner and pipe shops, in addition to piers and other accessories.

Favorable Report Expected Soon on $25,000,000 Fund for Converting Government Ships to Diesel Drive

(*Special Washington Correspondence*)

THE House Committee on Merchant Marine is expected to make a favorable report shortly on an amendment to the Merchant Marine Act of 1920 to make available a sum not to exceed $25,000,000 for the purpose of installing internal combustion engines in Shipping Board vessels and for loans to private ship owners and builders for installing Diesel engines. While the proposed amendment refers to internal combustion engines, the Diesel type is what is contemplated. Representative Edmonds of Pennsylvania had introduced a bill for this purpose but at a hearing before the committee, on January 11, Commissioner Benson, of the Shipping Board, presented a substitute which has since been under consideration by the committee. Several drafts have been made in collaboration between Admiral Benson and the committee and in the form in which it will be approved by the committee it is expected to be available in a few days.

$66,000,000 in Fund

The bill has in view the amendment of Section 11 of the Merchant Marine Act, which authorizes loans from the construction loan fund (in which there is about $66,000,000 to the credit of the Shipping Board) to citizens for the construction of the new vessels, and also the amendment of Section 12 of the act, the section which authorizes the board to recondition government vessels, so as to make available funds from the loan fund for the special work of reconditioning in the form of installing internal combustion engines by transferring funds from the construction loan fund.

Plans 50 Installations

It is proposed to make the installation in fifty Shipping Board vessels and one purpose is to develop and standardize the production of Diesel engines so as to develop an expert corps of workmen in this country who will be familiar with the work.

Herreshoff Designing Large Yacht

It is reported that Nat Herreshoff, the famous yacht designer of Bristol, R. I., is designing a schooner yacht 150 feet long on the waterline for Mr. Harold Vanderbilt.

Great Lakes Yard Gets New Ship Contract

THE Great Lakes Engineering Works, River Rouge, Mich., has been awarded a contract for the construction of a steel freight ship of 8,500 gross tons for H. K. Oakes of Cleveland, Ohio. It is understood that this ship will cost approximately $1,000,000 and will be similar to the new Ford ships now building except that this vessel will be driven by reciprocating instead of Diesel engines.

The ship will have a length of 586 feet, beam 62 feet, depth 32 feet, and will have American Bureau classification.

323-Boat Program Is Contemplated for Coast Guard Service

TENTATIVE plans for the construction and operation of a fleet of 323 boats by the Coast Guard Service in the suppression of liquor runners were announced before a meeting of the Marine Branch of the Society of Automotive Engineers by Capt. Q. B. Newman, Chief Engineer of the Coast Guard Service, at the Hotel Commodore on January 9th.

It was stated that the program involves an appropriation of $22,000,000 and is dependent on the wishes of Congress. The plan provides for a fleet of 223 motor boats each 70 feet long, 14 foot beam and having a speed of 18 miles per hour. Each of these vessels is to be propelled by twin screws driven by engines developing 400 horsepower with a fuel capacity of 1,000 gallons, cruising radius 700 miles and the boats to be of sturdy construction with heavy scantlings. Each of these boats is to be equipped with a one-pound gun and is to carry a crew of eight men.

An additional fleet of one hundred 36 foot boats is asked for to be used in inshore work, 70 of these vessels to be fitted with cabins and 30 open boats. They are to be driven by single screws and equipped with 150 to 200 horsepower engines.

The United States Engineer Office, Louisville, Ky., is preparing plans for three steel hull maneuver boat hulls, 24 feet by 60 feet, for the Cincinnati District.

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Oil Tanker to Have Diesel-Electric Drive

THE Atlantic Refining Company of Philadelphia has placed an order with the General Electric Company covering electric propelling equipment for converting one of their 8,000-barrel tankers to Diesel-electric drive, making the fourth equipment ordered by the Atlantic Company for this type of propulsion. The new tanker will be a bulk gasoline carrier for coastwise service.

Two 225 horsepower Ingersoll-Rand Diesel engines will be used, each driving one 155 kilowatt main generator and a 26-kilowatt auxiliary generator. The two generators will be connected in series and will drive a single 370 brake horsepower propelling motor, the vessel being of the single-screw type. Control will be of the Ward-Leonard or voltage type, being arranged for operation from the pilot house only. When the craft is in port, one of the main engine generators will be used for furnishing power for driving the cargo pumps while loading and unloading the tanker.

Two More Diesel-Electric Ferries for West Coast

The Golden Gate Ferry Company, of San Francisco, has placed an order with the General Electric Company for complete electric propulsion and control machinery for two new steel hull, double-ended ferry boats. These crafts will, it is expected, be operated in the same manner as the *Golden Gate* and *Golden West*, equipped with General Electric propulsion and control machinery and now running between Sausalito and San Francisco. It is expected the new boats will be run between the same points, releasing the older craft for new routes.

The two new ferryboats will be somewhat larger than the previous ones, having, instead of two main generating sets, three Werkspoor Diesel engines each direct-connected to a 270-kilowatt, 250 volt, direct current generator, a 30-kilowatt auxiliary generator being mounted on an extension of each main generator shaft.

American Brass Company Receives Big Order

THE American Brass Company was recently awarded a contract for 750,000 pounds of Anaconda Admiralty condenser tubes by the U. S. Shipping Board Emergency Fleet Corporation.

Operating the largest number of boats controlled by any American shipping concern, the U. S. Shipping Board is the largest purchaser of condenser tubes in this country. It is significant that The American Brass Company received this order immediately after completing shipments to the Emergency Fleet Corporation of 250,000 lengths of condenser tubes weighing 1,100,000 pounds.

Electric Hot Water Heaters Installed on the Seekonk

IN order that the supply of hot water for sanitary purposes might be assured while the vessel is in port, a new type automatic electric heater, known as the "Sepco" has been installed in the motorship *Seekonk*.

This heater, which was supplied by the Automatic Electric Heater Company of Warren, Pa., manufacturers of heaters for home and industrial as well as marine use, is of the latest type and equipped with a special temperature control which prevents excessive overheating of the water and consequent current waste

Hudson River Day Line Steamer Washington Irving

Fourth Hudson River Day Line Steamer Now Being Converted to An Oil Burner

THE Hudson River Day Line steamship *Washington Irving* is now being converted to an oil burner at the yard of the W. and A. Fletcher Company, Hoboken, N. J. This is the fourth vessel of the line to be fitted with Peabody oil burning equipment.

The *Washington Irving*, originally designed by the naval architect Frank E. Kirby in conjunction with the firm of J. W. Millard & Brother, New York, built by the New York Shipbuilding Company, Camden, N. J., and fitted with machinery made by the W. and A. Fletcher Company in 1913, is 416½ feet long overall, 84 feet beam over guards, 47 feet molded beam, 14 feet 5 inches depth and 8 feet 6 inches draft. She is propelled by steel feathering paddle wheels, 24 feet 6 inches in diameter. The main engine is of the 3 cylinder compound inclined type designed to develop 6,000 indicated horsepower. Steam is supplied at 170 pounds pressure by 4 single ended boilers, 12 feet 4 inches diameter by 11 feet 11 inches long and 2 double ended boilers, 12 feet 4 inches diameter and 22 feet long operating under Howden's system of forced draft. The *Washington Irving* is the largest steamer of her type and is licensed to carry the greatest number of passengers of any vessel in the world, her capacity being 6,000. She has a speed of 20 miles an hour.

Details of Conversion

The changing of this vessel from coal to oil fuel made it necessary to remove the coal bunkers and build in the place now occupied by them four tanks having a capacity sufficient to provide fuel for the run from New York to Albany and return, with a surplus for about one hundred miles. These tanks will be filled from a barge through a filling pipe extending out under the guards and ending in an ell, to which the hose from the barge will be attached. These filling pipes are placed on both sides of the vessel, and so arranged that oil can be run to any one or all of the four tanks at the same time.

The tanks are fitted with pneumercator gages showing the amount of oil in each tank and recording the amount of oil received or used. The tanks are connected by high and low suctions to the pumps, through strainers, and so arranged that while either pump is delivering oil to the burners, the other pump can draw from any tank desired and deliver to any one of the four tanks.

Two pumps of the horizontal duplex type made by Dean Brothers of Indianapolis are installed. These are of such size that either one will handle all the oil required, the other remaining in reserve. From the pump the oil passes through a Peabody air chamber of special design to the heaters, which are also in duplicate. These heaters are of the two-pass coil type made by the Griscom-Russell Company, New York, and arranged so that either one can be used, or so that oil can be by-passed directly through the strainer to the burners. The strainers, both suction and discharge, are of a type built to suit the Peabody Company's specifications by the Andale Company.

Peabody-Fisher Burners Used

The oil burners are the Peabody-Fisher wide range burners, which possess the unusual feature of regulating the amount of oil put through the burners by one valve, regardless of the number of burners in use. This burner also possesses a wide range in capacity, without loss in atomizing power, which does away with changing tips or putting out and relighting fires. This makes it possible to slow down the vessel when passing tows and to return to full speed without causing the boilers to blow off or causing any undue strains on the boilers due to rapid heating and chilling.

One of the important features of this system is the by-passing of the oil back to the tanks, which makes use of the heat in the oil not burned and reduces the amount of steam used in heating coils usually placed in the supply or settling tanks. The ability to by-pass the oil to any one of the four tanks desired gives an absolute control of the temperature of the oil supply, thereby increasing the economy as well as the flexibility of the oil control.

The ability to change the capacity of the burners by this simple method and the economy maintained while operating under any condition, from a full load to practically a "banked fire" condition, has been so satisfactory and economical on the steamer *De Witt Clinton* of the Hudson River Day Line, that it has resulted in their having the Peabody burners installed on the new steamer *Alexander Hamilton*, now being built for this line, as well as the *Hendrick Hudson* and *Washington Irving*, both of which steamers are being fitted with the Peabody burners, as described in this article.

To Build Oil Burning Tug

The McClain Sand Company, Point Marion, Pa., plans to build a new oil burning tugboat, 18 feet by 75 feet, with 100 horsepower engine. J. W. Bowers of the McClain Sand Company has charge of the plans

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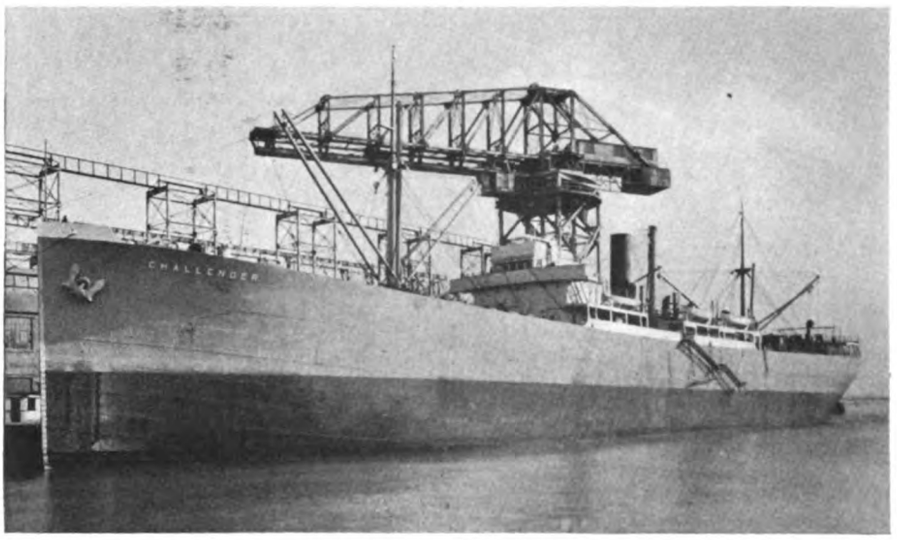

M. S. Challenger at Sun Shipyard for Installation of Diesel Engines

Motorship Challenger Has Successful Trial Trip

THE converted motorship *Challenger* was given a very successful trial on the Delaware River on January 17.

This vessel, originally a Shipping Board steamer built by the Bethlehem Shipbuilding Corp. and equipped with Scotch boilers and geared turbines, was purchased last year by the Sun Shipbuilding Company. The new owners have removed the original machinery and installed one of their Sun-Doxford opposed piston two-cycle Diesel engines, together with a complete system of Diesel-electric auxiliaries, including winches, steering gear and windlass. The auxiliaries are driven by Worthington 2-cycle engines and the generators and other electrical equipment have been furnished by the Westinghouse Company. Steam is only used for heating, a small oil-fired boiler being installed for this purpose.

The principal dimensions and particulars of the ship are as follows:

Length between perpendiculars	410 feet
Breadth, molded	56 feet
Depth, molded (shelter deck)	41 feet
Depth, molded (upper deck)	32 feet
Gross tonnage	7,590
Net tonnage	5,764
Load draft (summer)	30 feet 6 inches
Corresponding deadweight	11,620 tons
Weight of ship, light	4,310 tons
Bale cargo capacity	549,892 cubic feet
Grain cargo capacity	608,608 cubic feet
Fuel capacity	5,977 barrels
Fresh water capacity	145 tons
Engine, Sun-Doxford	3,000 I.H.P.
Speed, loaded	10½ knots
Fuel consumption	11 tons per day

The trial, which was entirely satisfactory, was witnessed by representatives of a large number of prominent shipbuilding and ship operating companies and by officials of the Shipping Board and the Steamboat Inspection Service.

National M. E. B. A. Holds 49th Annual Convention

FORTY delegates of the National Marine Engineers Beneficial Association met at the Franklin Square Hotel, Washington, D. C., on January 21, for the forty-ninth annual convention of the association, with William S. Brown, president, in the chair. The association continued its meetings during the week and at its first session listened to an instructive and interesting address on child labor, immigration, education and immigrant registration by Hon. James A. Davis, Secretary of Labor.

Later in the week Commissioner T. V. O'Connor, vice-chairman of the United States Shipping Board, addressed the convention urging that all possible repairs on vessels be made by the ships' crews as a means of keeping down the operating costs and thus helping American shipping to meet foreign competition. Fuel and ship repairs are two of the larger items of operating cost that are controlled by marine engineers, he said, and it is in reducing these items that engineers can do most for the merchant marine.

The annual banquet of the association was held on Wednesday evening, January 23. The entertainment features of the convention were furnished by the following patrons: Tidewater Oil Sales Corporation, Johns-Mansville, Inc., The Leslie Company, Dearborn Chemical Company, The Texas Company, The Garlock Packing Company, The Lunkenheimer Company, Jenkins Bros., Power, Vacuum Oil Company, France Packing Company, Anchor Packing Company, MARINE ENGINEERING AND SHIPPING AGE, Mason Regulator Company, Standard Oil Company of New York, U. S. Rubber Company, Garrett & Callahan, John Coleman and James Graham.

Freight Shipped on Great Lakes in 1923 Breaks All Records

One hundred and twenty-one million, one hundred and fourteen thousand, one hundred and thirty-seven net tons of freight shipped on the Great Lakes during season of 1923 breaks all records which were held by 1916, when 4,061,451 less tons were carried by boat. Official report of the Lake Carriers' Association of Detroit gives the following figures for each commodity in net tons:

Canadian grain from Fort William	8,745,630
Duluth grain (U. S.)	2,008,769
Lake Michigan grain	1,181,180
Limestone	9,920,422
Hard coal	3,480,471
Soft coal	29,656,557
Iron ore	66,121,108
1923 total freight	121,114,137
Previous record 1916	117,052,686

TRADE PUBLICATIONS

BOILER TUBE CLEANERS.—Lagonda tube cleaners for boilers and for special uses are described in a 44-page catalog, X-7, recently issued by the Lagonda Manufacturing Company, Springfield, Ohio.

LIT-O-SIL-O DECKING.—Four million square feet of Lit-O-Sil-O has been laid on over 500 ships and this fact has been made the subject of a folder sent out by the Marine Decking & Supply Company, Philadelphia, Pa.

HIGH SPEED STEEL FURNACES.—Steel heating furnaces for a great variety of steel heating, annealing, carburizing and heat treating purposes have been described in a bulletin sent out by the Chicago Flexible Shaft Company, Chicago, Ill.

GEARED MARINE TURBINES.—Structural details and descriptions of installations of geared marine turbines, made by the Bethlehem Shipbuilding Corporation, Ltd., Bethlehem, Pa., are contained in a complete catalog published by the company.

"SHELBY" SEAMLESS STEEL TUBES.—A recent publication of the National Tube Company, Pittsburgh, Pa., gives a detailed description of the manufacture of Shelby seamless steel tubes and contains technical information of value to men engaged in machine design and various mechanical engineering vocations having tubular requirements.

TWIST DRILLS.—A complete self-indexing catalog has been published by the Cleveland Twist Drill Company, describing its products, including drills, reamers, sockets, counterbores, mills, screw extractors, arbors, mandrels and high-speed tools. A special section is devoted to the famous Cle-Forge high-speed drill, which established a new world's drilling record on May 18, 1923, at the National Association of Purchasing Agents, Cleveland.

USED MARINE EQUIPMENT.—The Doty Engineering Company, Ltd., 209 York Building, Toronto, Ontario, Canada, has published a partial list of used marine equipment which will be mailed to any one interested upon request. The list includes crude oil and steam engines, condensers, pumps, Scotch boilers, gasoline boats, steam yachts, passenger steamers, tugs, wooden cargo steamers, steel cargo steamers, tow barges, sailing vessels, floating derricks and scows, direct connected generators and numerous miscellaneous items.

DE LAVAL PUMPS.—Centrifugal and motor-driven pumps are the subjects of two catalogs issued by the De Laval Steam Turbine Company, Trenton, N. J. The former emphasizes the marked development which has occurred in the improvement of centrifugal pumps, as well as in the direction of greater size and wider application. Centrifugal pumps driven by geared steam turbines are built in sizes up to 5,000 water horsepower and over. The second catalog contains the results of efficiency tests upon several large motor-driven pump units installed in municipal water works plants. These pumps range in size from 300 to 1,500 horsepower. The De Laval "Centrifugal Review" for December, 1923, is devoted solely to the use and manufacture of industrial centrifugals at the De Laval factory. This issue contains the complete outline of the manufacturing processes from the raw material to the finished products and is well illustrated with views of the plant and its offices.

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Marine Construction News of the Month

Ship Contracts — New Ship Concerns and Shipyard Improvements—Terminal Projects—Government Contracts

SHIPBUILDING AND REPAIRS

Engine Work, Newport News, Va.—Norwegian steamer Romsdalshorn went to Newport for engine repairs.

Leviathan Repairs, Hoboken, N. J.—Repairs to the hull of the Leviathan have been estimated at $100,000.

Cleaning and Painting, Seattle, Wash.—Steamship Faxen (Swedish) has been drydocked at Seattle for cleaning and painting.

Damage Repairs, San Francisco, Cal.—The tanker H. W. Baxter has been taken to the Union Iron Works for damage repairs.

Thorough Reconditioning, San Pedro, Cal.—The British tanker Santa Maria has been taken to San Pedro for a thorough reconditioning.

Two Steamers Drydocked, Vancouver, B. C.—The Prince George and Prince Rupert will be drydocked for annual overhauling at Vancouver.

Conversion to Oil Burner, Peoria, Ill.—The Peoria Grain and Barging Company, Peoria, Ill., plans to convert its steamer Illinois to an oil burner.

Tanker Drydocked, San Francisco, Cal.—For drydocking and to undergo general repairs, the tanker Java-Arrow has been taken to the Bethlehem yard.

Removal of Plates, Buffalo, N. Y.—The steamer Muncy has been placed on the docks of the Buffalo Drydock Company for the removal of 24 plates.

Cunarders to be Converted to Burn Oil.—The Cunard Line has announced that their liners, the Caronia and Carmania, will be converted to burn oil fuel.

Majestic to be Drydocked, Boston, Mass.—The White Star liner Majestic will be drydocked at Boston on March 27 for underwater cleaning and painting.

Steamship Drydocked, Chester, Pa.—The Gulf Refining Company's steamship Gulfstar has been drydocked at the yard of the Sun Shipbuilding and Drydock Company.

Drydocking and Repairs, Philadelphia, Pa.—The Italian tanker Dora has been placed on the drydock of the William Cramp & Sons Ship & Engine Building Company.

Drydocked for Painting, Philadelphia, Pa.—The Norwegian steamship Jacob Christensen has been drydocked for painting at the Cramp Ship and Engine Building yard.

Low Bidder, Oakland, Cal.—The Moore Drydock Company was lowest bidder for drydocking and painting the Shipping Board tanker Hagen, at recent bid openings.

Extensive Repair, San Francisco, Cal.—The Union Oil tanker Oleum is on the ways of the Union Iron Works for extensive repairs to her hull and cargo tanks.

Extensive Repairs, Newport News, Va.—The Shipping Board steamer Wekika is undergoing extensive bottom repairs and repairs to one of her tanks, at Newport News.

Nautical Schoolship Docked, Philadelphia, Pa.—For annual overhauling, the Pennsylvania State Nautical schoolship Annapolis has been docked at the Philadelphia Navy Yard.

New River Vessel, Portland, Ore.—The contract for the construction of a stern-wheel river steamer, 155 feet long and 35-feet beam has been awarded to the St. Helens Shipbuilding Company, Portland, Ore.

Miscellaneous Repairs, Chester, Pa.—The Sun Oil Company's tanker Sun has been drydocked by the Sun Shipbuilding and Drydock Corporation for miscellaneous repairs and painting.

Hull Repairs, etc., Baltimore, Md.—The steamer Santa Clara has been placed on the ways of the Bethlehem Shipbuilding Corporation's plant for repairs to her hull and for painting.

Digger and Barges, Evansville, Ind.—The Koch Sand & Gravel Company, Evansville, Ind., plans to build a new gravel digger and three wooden barges. B. Koenig, Transportation Manager.

Damaged Lighthouse, Baltimore, Md.—The relief Lightship No. 72 has been damaged to the extent of several thousand dollars, as a result of being struck by the steamer Steel Vendor.

Damaged Vessel Repairs, Oakland, Cal.—The damaged motorship Mary Hanlon has been towed to Oakland to the Hanlon shipyard, minus her rudder and with a heavy leak, for repairs.

Propeller Repairs, San Francisco, Cal.—The steamer Stockton, which recently lost one of her propeller blades while on her way to Manila, was ordered to return to San Francisco for repairs.

Additions to Floating Plant, Pittsburgh and Creighton, Pa.—The Pittsburgh Plate Glass Company, Pittsburgh and Creighton, Pa., are considering additions to their floating plant equipment.

Annual Overhauling, etc., Jacksonville, Fla.—The steamship Cuba, of the Peninsular & Occidental Steamship Company, has been taken to Jacksonville for annual inspection, overhauling and painting.

Extensive Reconditioning, San Francisco, Cal.—The steamer Panaman has been placed on the ways of the Bethlehem Shipbuilding Corporation to undergo general repairs, drydocking, cleaning and painting.

Tanker Repairs, San Francisco, Cal.—The Bethlehem Shipbuilding Corporation has been awarded the contract for making repairs to the Union Oil Company's tanker San Patricio, at a cost of $80,000.

Tugs Converted to Oil Burners, Brunswick, Ga.—The tug Cecilia has been at Brunswick being reconditioned and transformed into an oil burner and upon completion of work on her the Waban will also be made into an oil burner.

To Be Placed in Condition, San Francisco, Cal.—After having been idle for some time, the steamer Enterprise, of the Matson fleet, will be drydocked at the Bethlehem Shipbuilding Corporation's yard preparatory to being placed in service again.

To Rebuild Tug, New York.—Bids were opened on January 14th by the Merritt-Chapman-Scott Company, New London, Conn., for the reconditioning of the tug Guardsman. The vessel was recently burned and the upper works will be rebuilt.

Extensive Repairs, Paducah, Ky.—The Kentucky Rock Asphalt Company, Bowling Green, Ky., will make extensive repairs to their towboats, General Logan and Emma, the work to be carried out at the Ayer & Lord Marine Ways at Paducah, Ky.

Carfloats, New York.—The D. L. & W. Railroad Company has issued plans and specifications for the construction of two steel carfloats. The boats will be of the three-track type having an overall length of 270 feet, beam 38 feet 6 inches, and draft 10 feet.

Shipyard Work, Alameda, Cal.—The following are undergoing repairs at the Alameda Drydock Company's yards: Ferry Golden Gate, steamer Helene, steamers Ryder Hanify, Elizabeth, Cuba, Point Judith, Unimak, Munrio and Star of England.

Catamarans Awarded, Baltimore, Md.—Authority was received by Col. Gilbert A. Youngberg, United States district engineer, Jacksonville, on January 5, to award a contract for fifteen pontoon catamarans to the Novelty Steam Boiler Works, of Baltimore, Md., at $14,430. The catamarans are to be used on the United States dredge Major J. C. Mallory.

Ship Work, Chester, Pa.—The Sun Shipbuilding & Drydock Company is engaged in making miscellaneous repairs and painting the steamship Topa Topa. The Bessemer City, of the Isthmian Line's fleet, has been drydocked at the same yard for repairs.

Steamer to be Reboilered, Philadelphia, Pa.—Specifications for the reconditioning of the Merchants & Miners Steamship Essex have been issued from the office of Division Superintendent John Leigh, Pier 18-20, South Delaware Avenue, Philadelphia.

Bethlehem Activities, San Francisco, Cal.—The Bethlehem Shipbuilding Corporation is building a barge for the Shell Company and repairing the following steamers: Virginia, Anahuac, Benowa, William F. Herrin, Johanna Smith, Everett and Los Alamos.

President Pierce Repairs, Mare Island, Cal.—The Mare Island Navy Yard, Mare Island, Cal., received the work of repairing and reconditioning the liner President Pierce, operated by the Pacific Mail, from the Shipping Board, at a price of $400,000.

General Repairs, Sparrows Point, Md.—The Bethlehem Shipbuilding Corporation, Sparrows Point plant, has received a contract for docking and generally repairing the Baltimore Steamship Company's steamer Vittore Emanuele III., of the Glasgow Line, at a price of $11,000.

Conversion to Burn Oil, Mare Island, Cal.—Colonel Herbert Deakyne, United States army engineer in charge of rivers and harbors work in the San Francisco district, has stated that the dredge Culebra will be taken to Mare Island to be changed from a coal to an oil burner.

Miscellaneous Work, Chester, Pa.—The Sun Shipbuilding & Drydock Company has received the contracts for miscellaneous repairs to the steamship Vincent, of the International Freighting Corporation, and the tanker Eugene V. R. Thayer, to be drydocked for voyage repairs and painting.

Ship Contract, England.—Word comes from England of the placing of orders with Stockton and Sunderland Shipbuilding yards, by the newly organized Tree Steamship Company, Ltd., of Cardiff, for two cargo steamers, each of 2,300 tons deadweight, for delivery about May or June, next.

Barges to be Built, Pascagoula, Miss.—Instructions have been received at the government shipyard at Pascagoula to start work immediately on three creosoted wooden barges, to be 100 feet long, 30 feet wide and five feet deep, for use at the locks and dams of the Tombigbee River section.

Idle Steamer Reconditioning, Newport News, Va.—The Shipping Board steamer Western Ocean, idle for more than a year in Hampton Roads, has been taken to Newport News for reconditioning for service. She will be operated by Trosdal, Plant and Lafonta, from Gulf ports to the United Kingdom.

New Tug Planned, Savannah, Ga.—Plans for a 124-foot wooden towboat for the Savannah River Lumber Company, Savannah, Ga., have been prepared by Otto S. Volt, 226 Meigs Avenue, Jeffersonville, Ind., and submitted to the company. It has been announced that construction will begin in the near future.

Annual Overhauling, etc., Los Angeles, Cal.—The Los Angeles Steamship Company's liner Yale

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has been placed on the Los Angeles Shipbuilding and Drydock Company's ways for annual overhauling and reconditioning. When the Yale is placed back on the run, her sister ship, the Harvard, will undergo similar reconditioning.

Six-Scow Contract, Washington, D. C.—A contract to build six large sand scows for the Smoot Sand and Gravel Corporation, of Washington, D. C., has been awarded to M. Mitchell Davis & Son, shipbuilders at Solomons, Md., for delivery in the spring. The same firm is building a 60-foot yacht for Robert Roebling, of New York.

Dredge Repairs Awarded.—Upon receipt of bids by the United States Engineer Office, Jacksonville, Fla., for repairs to the dredge Mallery, the Merrill-Stevens Dry Dock & Repair Company, Jacksonville, was awarded the contract. The prices were: Merrill-Stevens Dry Dock & Repair Company, $19,995; Gibbs Gas & Engine Company, $36,218.

Dredge Repair Contract, Jacksonville, Fla.—The Merrill-Stevens Shipbuilding Company, Jacksonville, Fla., has been awarded the contract for repairing the United States dredge Major J. C. Mallory, which has been in service in the St. John's River for some time. The contract price is $19,955, four companies having submitted bids on the work.

Boiler Tube Installation, Seattle, Wash.—The Todd Shipyard Corporation, Seattle, is installing a total of 24,000 new tubes in the boilers of the Admiral Line's fast steamer, H. F. Alexander, as a result of which it is expected she will reduce her running time by one hour between Seattle and San Francisco, when she again enters service on March 4.

Reconditioning Progressing Rapidly, Newport News, Va.—It is announced from Norfolk, Va., that the work of reconditioning the American steamer President Buchanan, now at the Newport News Shipbuilding and Drydock Company's plant, is progressing rapidly. She is expected to be ready for service some time this month, her name being changed to Republic.

Repairs, Pacific Coast.—At the opening of tenders for repairs on the Shipping Board freighter West Cactus, the Moore Drydock Company, of Oakland, Cal., was low bidder. The work consists of installing a new stern frame, and drydocking, cleaning and painting. The contract was awarded to the Moore yards at a price of $27,954.90, the Bethlehem bid being $28,537.90.

Tug Conversion, Philadelphia, Pa. The cofntract for converting the tug Charles Rowell, of the Diamond P. Towboat Company, from a coal-burning reciprocating engine-propelled craft to internal combustion propulsion, and to change the craft from a twin-screw to a single screw vessel, has been awarded to the William Cramp & Sons' Ship and Engine Building Company.

Maneuver Boats, Louisville, Ky.—The United States Engineer Office, Louisville, Ky., is preparing plans for two steel hull maneuver boats for use at Ohio River locks and dams, the boats to be 24 feet by 60 feet by 5 feet. They will cost, exclusive of machinery, approximately eight or ten thousand dollars. One of the hulls is for the Huntington, W. Va., district.

Tanker Repairs, Newport News.—The Newport News Shipbuilding & Drydock Company, Newport News, Va., has been awarded the contract for extensive repairs to the tank steamship Georgia, of the Texas Company, following the opening of bids on January 24. The ship sustained considerable bottom damage as the result of being stranded on a reef off St. Augustine, Fla.

Miscellaneous Repairs, San Francisco, Cal.—The British steamer Indian City has been placed on the Bethlehem docks to have a new tailshaft and propeller installed. The Standard Oil tanker J. A. Moffet has also gone to the same yard for general repairs. The freighter Edgar F. Luckenback has been placed on the company's drydock for survey and to undergo repairs for damage to her hull.

Low Bidder, San Francisco, Cal.—At the opening of bids for voyage repairs to the steamer West Sequana, the General Engineering & Drydock Company submitted the lowest tender, the prices being as follows: General Engineering, $1,113; Theodore H. Smith, $1,194; Main Iron Works, $1,194; Bethlehem, $1,437; Eureka Boiler Works, $1,485; Crowley Shipyards, $1,500; Moore Drydock Company, $1,620, and United Engineering, $1,987.

Alterations to President Ships, New York.—At the opening of tenders by the Robert Dollar Company, 15 Moore Street, New York City, on January 14, for installing specie tanks for carrying bullion and post offices on each at the following ships—President Adams, President Monroe, President Polk, President Van Buren, President Garfield the W. & A. Fletcher Company submitted the lowest price on each ship or a total for the five vessels of $19,710.

Steamer to be Placed in Service Again, Hampton Roads, Va.—The Shipping Board steamer Monmouth has been taken from the idle fleet at Camp Eustis to be put back in service and has been taken to Colonna's Marine Railway at Norfolk for minor repairs and bottom painting. She has been assigned to the Black Diamond Corporation for immediate delivery and will make frequent trips to Hampton Roads and Baltimore for freight cargoes.

Radio Contracts.—Contracts to install standard radio apparatus on the new Red D liner Carabobo and the new Savannah liners City of Chattanooga and City of Birmingham have been awarded to the Radio Corporation of America. The same corporation has also been awarded contracts covering the radio service of the Argonaut Line steamer Pacific, the steam yacht Norada, owned by Henry Walters, and the yacht Ripple, owned by Clifford M. Leonard.

Conversion to Ferryboat, Seattle, Wash.—The Todd Shipbuilding Corporation, Seattle, has been awarded the contract for converting the express steamship Seattle into a ferryboat, with space for fifty to sixty automobiles. The Seattle will be followed to the yard by the Puget Sound Navigation Company's steamship Sioux, which will also be converted into a ferryboat with space for forty to fifty automobiles. The two projects will cost approximately $300,000.

Repairs and Drydocking, San Francisco, Cal.—At the opening of bids for repairs and drydocking of the Hart-Wood Lumber Company's steam schooner Robert Johnson, the General Engineering and Drydock Company submitted the lowest price. The following are the proposals: General Engineering, $4,313 and five days; Hanlon Drydock and Shipbuilding Company, $6,100 and nine days; Moore Drydock Company, $6,170 and eight days, and the Bethlehem Shipbuilding Corporation, $6,614 and nine days.

Trial Trip, Camden, N. J.—The new Red "D" liner Carabobo, built by the New York Shipbuilding Company, Camden, left that city on January 2 for New York on her trial trip, with more than 100 people representative of the shipping and commerce of the port as guests of the company. On January 12 the new ship sailed on her maiden voyage to South Atlantic island ports. She has a length of 500 feet, 48-foot beam and is a vessel of 6,000 tons, with cabin accommodations for about 85 people.

Sternwheel Towboat, Memphis, Tenn. At the opening of tenders by the United States Engineer Office, 1006 McCall Building, Memphis, Tenn., for one steel hull sternwheel towboat, the following companies submitted prices: Howard Shipyards & Dock Co., Mobile, Ala., $119,743, 181 days; Todd Shipbuilding & Drydock Co., Mobile, Ala., $122,000, 225 days; Charles Ward Engr. Works, Charleston, W. Va., $173,675; Bravo Contracting Co., Pittsburgh, Pa., $181,500; Sun Shipbuilding & Drydock Co., Chester, Pa., $188,855.

Installation of Post Office, San Francisco, Cal.—The General Engineering and Drydock Company has received the contract for installing a post office on board the Pacific Mail liner President Taft, the prices submitted being as follows: General Engineering, $4,943; Moore Drydock Company, $5,555; United Engineering Company, $5,768, and Bethlehem Corporation, $7,350. The Dollar Steamship Company will also have a post office installed on the liner President Hayes before she sails on her maiden voyage on a trip around the world.

Shipyard Work, Mobile, Ala.—The Alabama Dry Dock & Shipbuilding Company has been awarded the following work: Complete overhauling of the steamship Wytheville, recently allocated to the Munson Line; Gulf Refining Company's steamer Gulfcoast, drydocking, scraping and painting; engine room repair job on the steamship Steel Traveler; steamship Putney, for cleaning, scraping and painting hull to deep water line, repairs to rudder and renewing of leaky rivets; repairs of a miscellaneous nature to the Munson liner Munerie, and steamship Choctaw for cleaning, scraping and painting bottom, and boiler work.

Passenger and Freight Steamer Launched, Sparrows Point, Md.—On January 12, the combined passenger and freight steamer New York, being constructed by the Bethlehem Shipbuilding Corporation for the Eastern Steamship Lines, Inc., was successfully launched at the Sparrows Point plant of the Bethlehem Corporation. The boat is to be placed in night service between Boston and New York, operating through the Cape Cod Canal, this coming summer season. The New York is a steel turbine-driven, twin-screw and oil-burning steamship, having a length of 402 feet, and is of 5,000 gross tons. She is capable of developing a speed of 19 knots, her designer being Theodore E. Ferris of New York. Her passenger capacity will be 500 in addition to a crew of 168.

Ship Repairs, West Coast.—The Bethlehem Shipbuilding Corporation, San Francisco, Cal., has received several ship repair contracts. The company was awarded two contracts covering repairs and reconditioning of the Shipping Board tanker Stockton, operated by Struthers & Barry, and the around-the-world liner President Hayes, of the Dollar Steamship Company. The Bethlehem Corporation was low on three different proposals for work on the President Hayes. For renewing the vessel's tailshaft, drydocking, cleaning and painting the bids were: Bethlehem, $11,796, and Moore Drydock Company, $8,616.80, the Moore yard not covering the work of renewing the tailshaft in their contract. For general repairs, including work on the President Hayes' boilers, the prices submitted were: Bethlehem, $8,035; Main Iron Works, $8,286; Eureka Boiler Works, $8,311; Crowley's, $8,423; Moore's, $8,468; General Engineering, $8,832.50; United Engineering, $8,919, and Theodore Smith Company, $9,013. For reinsulating refrigerator spaces and other work on the cold storage plant of the President Hayes, the following tenders were received: Bethlehem, $17,850; Shipley Construction Company, $18,500.

GOVERNMENT WORK

Cranes, Florence, Ala.—U. S. Engineer, Florence, plans to purchase two 150-ton cranes for Wilson Dam.

Bids Rejected for Quarterboat, Huntington, W. Va. U. S. Engineer, rejected bids for one 45 by 26 by 80 foot steel quarterboat.

Shore Line Pipe, Galveston, Tex.—U. S. Engineer Office, Galveston, opened bids on January 22 for 17,000 feet shore line pipe, 20-inch.

Turbines, Florence, Ala. Bids will be received by U. S. Engineer Office about February 1 for 35,000 horsepower turbines for Wilson Dam.

Sale of Dipper Dredge, Buffalo, N. Y. The Buffalo Engineer Office will open bids on January 30 for the sale of a dipper dredge (4½-yard dipper).

Steel Hull, New Orleans, La.—The Jahncke Drydock Company, New Orleans, was awarded the contract for one steel hull for derrick-boat, at $18,680.

Barges, Portland, Ore. Bids closed on January 24 for four stone barges (wooden) for U. S. Engineer Office, new P. O. Building, Portland, Ore.

Turbines, Florence, Ala. The Florence, Ala., Engineer Office will open bids about February 1 for four 35,000 horsepower turbines for Wilson Dam.

Steel Spud, Duluth, Minn.—The U. S. Engineer Office, Duluth, Minn., received sealed proposals until January 25 for one steel spud for a U. S. dredge.

Snagboat, Wilmington, N. C.—U. S. Engineer Office, Wilmington, N. C., opened bids on January 28 for one steel hull stern wheel snagboat, 90 feet long.

Bids Rejected for Maneuver Boat, etc., Huntington, W. Va.—U. S. Engineer, rejected bids for a steel hull maneuver boat, etc., for Dam 32, Ohio River.

Castings, Owensboro, Ky.—U. S. Engineer, P. O. Box 72, Louisville, plans to purchase 44 tons of cast iron castings for lock valves at Dam 46, Ohio River, here.

Gates, Green River, Ky.—Louisville Engineer Office, P. O. Box 72, Louisville, Ky., plans replacing upper and lower wooden gates at Lock 5, here, with steel gates.

Steel Sheet Piling, Louisville, Ky.—The U. S. Engineer Office, P. O. Box 72, Louisville, Ky., will open bids about February 8 for 1,550 tons of steel sheet piling for Ohio River dams. Estimated cost, $90,000.

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Steel House, Wilmington, Del.—Sealed proposals will be received until February 1 at the office of the U. S. Engineer, War Department, for a steel house on quarterboat.

Contract Awarded, Portland, Ore.—The U. S. Engineer Office, P. O. Building, awarded the contract for 230,000 tons of rock for Umquah Jetty to Joplin & Eldon, McKay Building, $326,600.

Pumping Unit, District of Columbia.—Commissioners of the District of Columbia opened bids on January 25 for one motor-driven centrifugal pumping unit with a capacity of 3,000,000 gallons per day.

Dredge Pump, Savannah, Ga.—U. S. Engineer, Savannah, awarded a contract for one 20-inch dredging pump for dredge to Ellicott Machine Corporation, Bush and Severn Streets, Baltimore, Md., at $6,190.

Cement and Crane, Milwaukee, Wis.—U. S. Engineer, Milwaukee, Wis., will open bids about February 10 for 13,500 barrels of cement and also will open bids on January 22 for one revolving steel crane.

Lumber, Addison, Ky.—U. S. Engineer, P. O. Box 72, Louisville, plans to purchase 30,000 feet of white oak select dimension, 8- to 20-foot lengths, 35,085 feet of white oak common dimensions, 9- to 12-foot lengths, f. o. b. here.

Jetty Repairs, Jacksonville, Fla.—The U. S. Engineer Office, Jacksonville, will receive sealed proposals until 12 M., February 6, 1924, for jetty repairs at the entrance to St. Johns River, Fla. Further information on application.

Steel House on Quarterboat, Wilmington, Del.—The U. S. Engineer Office, Wilmington, Del., will receive sealed proposals until 11 A. M., February 1, 1924, for constructing steel house on quarterboat. Further information on application.

Mooring Mast and Winches, Washington, D. C.—The Navy Department, Bureau of Yards & Docks, opened bids on January 30 under Specification 4916, for the erection of a mooring mast and installation of winches at the Naval Operating Base, San Diego, Cal.

Forgings, etc., Owensboro, Ky.—U. S. Engineer, P. O. Box 72, Louisville, plans to purchase 10 tons of cold rolled steel forgings, 1,700 pounds of phosphor bronze castings, 28 tons reinforcing bars, etc., for river wall valves, Dam 46, Ohio River, Owensboro.

Dredging, Flushing Bay, N. Y.—Sealed proposals were received by the U. S. Engineer Office, Room 710, Army Building, 39 Whitehall Street, New York, N. Y., until 12 M., January 14, 1924, for dredging in harbor at Flushing Bay, New York, N. Y.

Contract Awarded, Baltimore, Md.—The Savannah Engineer Office has awarded the contract for one 20-inch dredging pump to the Ellicott Machine Corporation, Baltimore, at $6,190. The Reading Iron Company, Reading, Pa., was next low bidder at $6,380.

Swinging Engines, Louisville, Ky. U. S. Engineer, Louisville, Ky., will be in the market soon for five swinging engines for use on derrick boats. The engines are to be either single or twin drum, double cylinder, 7 inches by 10 inches, and compound geared.

Harbor Funds, Washington, D. C.—Announcement has been made by the army engineer corps of the following allotments of river and harbor funds from current appropriations: Miami harbor, Florida, $15,000; Kennebec River, Maine, $1,000; Kahului harbor, Hawaii, $2,000.

Stone for Jetty, Humboldt Bay, Cal.—U. S. Engineer Office, San Francisco, Cal., will receive sealed proposals until 11 A. M., March 10, 1924 for furnishing and delivering stone for jetty construction at entrance, Humboldt Bay. Further information on application.

Four Hydraulic Turbines, Florence, Ala.—Sealed proposals will be received by the U. S. Engineer Office, Florence, until 11 A. M., March 1, 1924, for furnishing and delivering four hydraulic turbines each of 35,000 horsepower, with governors. Further information on application.

Lighthouse Equipment, Ketchikan, Alaska. The Superintendent of Lighthouses, Ketchikan, will open bids on February 12 for the following equipment for Cape Spencer Light Station, Alaska: One gasoline hoist (30 horsepower) two drum, with derrick swinging gear, and one stiff leg derrick.

Dredging, Puget Sound, Wash.—Specifications 4708, Bureau of Yards & Docks, Navy Department, Washington, D. C., awarded the contract for dredging approximately 68,000 cubic yards place measurement, Navy Yard, here, to Puget Sound Bridge and Dredging Company, Central Building, Seattle, $48,750.

Traveling Cranes, Florence, Ala.—Sealed proposals will be received by the U. S. Engineer Office, Florence, until 11 A. M., February 5, 1924, for furnishing, delivering and erecting electric traveling cranes of 150 tons' capacity in the power-house of Wilson Dam, Tennessee River. Further information on application.

Operating Machinery, Louisville, Ky.—The Louisville Engineer Office, P. O. Box 72, awarded the contracts for operating machinery for Dams 44 and 45, Ohio River, to H. P. Gazzam Machine Company, 3200 Penn Avenue, Pittsburgh, Pa., Lot A, $20,950; to J. & J. B. Milholland Company, 714 Fifth Avenue, Pittsburgh, Pa., Lot B, $13,045.

Dredging, New York, N. Y.—U. S. Engineer Office, 2nd District, Army Building, awarded the contracts for dredging in Newark Bay, N. J., to G. H. Breymann & Brothers, 17 Battery Place, Area 1, $0.5475; Morris & Cummings Dredging Company, 17 State Street, Area 2, $.25; Atlantic Gulf & Pacific Dredging Company, 13 Park Row, Area 3, $0.2764.

Cement, Florence, Ala.—The Florence Engineer Office awarded the contracts for furnishing 115,000 barrels of cement for use at Wilson Dam as follows: To Atlas Portland Cement Company, B M Building, Birmingham, 63,334 barrels, f. o. b. Leeds, $2.25; to signal Mountain Portland Cement Company, James Building, Chattanooga, Tenn., 20,000 barrels, f. o. b. Chattanooga, $2.11; to Lehigh Portland Cement Company, Birmingham, 31,666 barrels, f. o. b. Boyles, $2.25.

Lumber, Owensboro, Ky.—U. S. Engineer, P. O. Box 72, Louisville, awarded the contracts for furnishing lumber for Dam 46, f. o. b. Owensboro, as follows: Lot (1) 125,000 feet of No. 1 yellow pine, s. i. s. i. e., to Daly Lumber Company, 905 Andrews Building, Cincinnati, Ohio, $34 per M; Lot (2) 24,000 feet of No. 1 yellow pine rough, to Great Southern Lumber Company, Todd Building, Louisville, $35; Lot (3) 52,000 feet of Deuse merchantable yellow pine 8/4s, to Nicola, Stone & Myers Company, Hattiesburg, Miss., $44.30.

PORT IMPROVEMENTS

Levee, Ennis, Tex.—Ellis County rejected bids for a 1,000-foot levee, 50,000 cubic yards excavation, etc., $250,000.

Wharves, etc., Tampa, Fla.—A vote will be held by the city of Tampa on February 12 on $75,000 bonds for wharves and sheds.

Pier, Biloxi, Miss.—Biloxi Park Commission has awarded a contract to C. A. Thompson, Biloxi, for a pier. Engineer's estimate, $25,000.

Grain Elevator, etc., Greenville, O. Soyco Milling Company plans elevator and dryer to replace one recently destroyed by fire. $150,000.

Grain Elevator, Weatherford, Tex.—H. J. Bradfish Elevator Company plans grain elevator. $50,000-$75,000. Engineer and architect not announced.

Dock, Buffalo, N. Y.—General Chemical Company, 350 Abbott Road, plans 650-foot pile and concrete dock in Buffalo River, at Abbott Road. To exceed $100,000.

Harbor Improvements, Milwaukee, Wis.—City included $500,000 bond issue in 1924 budget, for harbor improvements. Harbor Commission, City Hall, in charge.

Contract Awarded, Beaumont, Tex.—Josey Miller Grocery Company has awarded the contract for a 100,000-bushel grain elevator, concrete, to E. H. Ingram, Joplin, Mo., $75,000.

New River Inlet Completion, Ft. Lauderdale, Fla. Broward County was scheduled to hold an election on January 5 for the purpose of voting $50,000 bonds to complete New River Inlet.

Terminal Warehouse, Louisville, Ky.—The Inland Waterways Company, 316 W. Jefferson Street, Louisville, will receive bids this spring for a $100,000 terminal warehouse on the river front, here.

Levee, Wylie, Tex.—L. Blaylock, mayor of Dallas, is interested in information of Levee District, for improvements at Wylie Lake and vicinity, Rockwell County. $1,000,000. Engineer not announced.

Levee, Rowlett, Tex.—Dallas Levee Improvement District 9, Court House, Dallas, plans levee improvements near Rowlett, Dallas County, $55,000. McKay & Montgomery, Andrews Building, Dallas, engineers.

Bonds for Inlet, West Palm Beach, Fla.—Lake Worth Inlet District voted $125,000 bond issue to construct inlet to connect Lake Worth with the Atlantic Ocean. C. Holsblaw, West Palm Beach, engineer.

Levee, Jonesboro, Ark.—Bay St. Francis Drainage District is having preliminary plans prepared for a 25-mile levee work and drainage ditches in Craighead County. Cobb & Lee, American Trust Building, engineers.

Pier, Baltimore, Md.—On January 22, the Baltimore & Ohio Railroad, B. & O. Building, received bids for a 2-story, 185 by 1,046 feet, concrete and brick pier, Locust Point. $1,500,000. H. A. Lane, chief engineer.

Levee, Osceola, Ark.—St. Francis Levee Board awarded a contract for a 3,200-foot loop in levee, to Roach, Stancil, Lowrance Brothers & Company, North Memphis Savings Bank Building, Memphis, Tenn. $125,000.

Breakwater, Thessalon, Ont.—The Department of Public Works, Parliament Buildings, Ottawa, awarded a contract for a wood breakwater extension to V. T. Bartram, Bank of Ontario Building, Toronto, $38,321.

Jetty, New Westminster, B. C.—Sealed proposals were received on January 21 by L. H. Colman, secretary, Department of Public Works, Ottawa, Ont., for completing Steveston Jetty, at mouth of Fraser River. $25,000.

Pier, Hamilton, Ont.—Harbor Board of the Department of Public Works, Parliament Buildings, Ottawa, is having plans prepared for a pier, 3,000 feet long, 200 feet wide, at Ottawa Street, here. K. M. Cameron, chief engineer.

Levee, Lake City, Ark.—Cane Island Drainage District 26 has had plans prepared and takes bids about February 15, for levee construction and floating dredge work. $80,000. Cobb & Lee, American Trust Building, Jonesboro, engineers.

Dock and Wharf, Oshawa, Ont.—The Department of Public Works, Parliament Buildings, Ottawa, is having surveys made for dock and wharf, concrete on wood piles, in harbor, Oshawa. $150,000. K. M. Cameron, chief engineer.

Pier Shed Extensions, San Francisco, Cal.—The State Board of Harbor Commissioners, Ferry Building, has awarded the contract for pier shed extensions, Islais Creek Terminal, to Grant & Hart, 571 42nd Avenue, San Francisco. $45,623.

Harbor Improvements, Chantry Harbor, Ont.—Plans are being prepared for improving Chantry Harbor, largely dredge work, with repairs to piers, by the Department of Public Works, Ottawa, Ont. $50,000. K. M. Cameron, chief engineer.

Grain Elevator, Edmonton, Alta.—The Department of Trade & Commerce, Parliament Buildings, Ottawa, Ont., plans reinforced-concrete elevator on pile foundation. $500,000. C. D. Howe & Company, Whalen Building, Port Arthur, Ont., engineers.

Pier Shed, New York, N. Y.—J. H. Delaney, commissioner of Docks, Pier "A," North River, awarded the contract for West 44th Street, Pier Shed, North River, Contract 1810, superstructure to Triest Contracting Corporation, 247 Park Avenue; $813,860.

Contract Awarded, New Orleans, La.—The contract for a steel superstructure for Claiborne Street shed has been awarded to Lukens Steel Company, 626 South Peters Street, by the Board of Port Commissioners, New Orleans Court Building, at a price of $150,000.

Recreation Pier, West Palm Beach, Fla.—The city commissioners are planning to call an election for some time within the near future when the freeholders will be asked to vote $200,000, which would be devoted to a public recreation pier on the lake front.

Pier Shed, San Francisco, Cal. The contract for a pier shed, Islais Creek Terminal, has been

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awarded to Grant & Hart, 571 42nd Avenue, San Francisco, at a price of $45,623, by the State Board of Harbor Commissioners, Ferry Building, San Francisco.

Port Terminal Repairs, Charleston, S. C.—Shipping Board agents have begun a survey of the Charleston Port Terminals, which passed into the control of the Board a short time ago, indicating the probability of considerable repair and improvement work.

To Readvertise Bids, Port Arthur, Tex.—Kansas City Southern Railroad, 11th and Wyandotte Streets, Kansas City, Mo., rejected bids on a 600,000 bushel elevator, reinforced-concrete, here, $500,000. A. M. Reece, care of owner, engineer. Will be readvertised.

Canal Improvement, West Palm Beach, Fla.—Plans are being made by the Florida Canal and Transportation Company, which recently acquired the Florida East Coast canal, for considerable improvements in the canal, with the view of establishing a line of boats.

Harbor Improvements, Saugeen, Ont.—Department of Public Works, Parliament Buildings, Ottawa, is having plans prepared for improving harbor, dredging, deepening, extending and repairing wharves and piers in Saugeen Harbor. $120,000. K. M. Cameron, chief engineer.

Creosoted Lumber, New Orleans, La.—The Board of Commissioners of the Port of New Orleans, Suite 200, New Orleans Court Building, received sealed proposals on January 17, for furnishing approximately 140,000 feet, board measure, creosoted lumber. Requisition ED-14426.

River Terminal Facilities, Louisville, Ky.—Work will begin shortly on the new $1,000,000 Ford Motor Company's assembly plant at Louisville, on the Ohio River. It is proposed to construct river terminal facilities, dock, etc., later, as the company plans to use the Ohio for shipments.

Creosoted Piles, New Orleans, La.—Sealed proposals were received by the Board of Commissioners of the Port of New Orleans, Suite 200, New Orleans Court Building, on January 17, for furnishing 370 creosoted piles in 60 and 70 foot lengths. Requisition ED-14425. J. H. Walsh, General Manager.

Warehouse on River Front, Louisville, Ky.—The Inland Waterways Company, 311 West Jefferson Street, Louisville, Ky., plans to build a $100,000 warehouse on the river front at Louisville to be used as storage and distributing center for steel products, particularly those of the American Steel & Wire Company.

Creosoted Material, New Orleans, La.—Sealed proposals were received by the Board of Commissioners of the Port of New Orleans, Suite 200, New Orleans Court Building, on January 24, for furnishing approximately 102,000 feet, board measure, creosoted material. Requisition ED-14329. J. H. Walsh, general manager.

Canal Work, St. Catharines, Ont.—Bids were received on January 15 by J. W. Pugsley, secretary, Department of Railways & Canals, Parliament Buildings, Ottawa, for earth and rock excavation, mass and reinforced-concrete, reinforcing and structural steel, canal gates, etc., for Section 8, Welland Ship Canal. $5,000,000. W. A. Bowden, chief engineer.

Shipping Terminal, Seattle, Wash.—The Pacific Steamship Company, L. C. Smith Building, awarded the first unit of the $2,000,000 terminal development at Seattle, freight shed, 160 by 1,000 feet, steel frame and corrugated iron, general contract to Albertson, Cornell Brothers & Walsh, South 12th and Pacific streets, Tacoma. Architects' estimate, $500,000.

Fender System, New Orleans, La.—The Board of Commissioners, Port of New Orleans, received sealed proposals on January 24, for the construction of a fender system along approximately 2,065 feet of wharf frontage, approximately 370 feet of railway trestle and other pile driving at the Claiborne Avenue Landing on the Inner Harbor Navigation Canal. Requisition ED-14423.

Dredging, Cape May, N. J.—Sealed proposals were received on January 15, by the Board of Commerce and Navigation, State House, Trenton, for redredging section of inland waterway in Grassy Sound Channel, Richardson's Channel and Suaires Channel, Cape May County. V. Gelineau, 1 Exchange Place, Jersey City, director. H. J. Sherman, 501 Cooper Street, Camden, engineer.

Levee, Kaufman, Tex.—Kaufman County Levee District 1 is having plans prepared for excavation for levee, $140,000. C. T. Forest, Waxahachie, engineer; the district will soon take bids (about February 1) for levee improvements in District 4, including 1,000,000 yards of earth work, two 24-inch centrifugal pumps, oil engine driven, and spillway, $175,000. B. F. Williams, Rosser, engineer.

Dredge Depot Construction, Jacksonville, Fla.—Col. Gilbert A. Youngberg's office, United States District Engineer, Jacksonville, has announced that a United States engineers' dredge depot will be constructed in Jacksonville at a cost of approximately $60,000, in the near future. Proposals for material and labor in connection with the project will be asked shortly. A wharf 300 feet in length will be built; also a bulkhead, storehouse with rail terminal service, and storage yard for coal and miscellaneous supplies.

New Plans for Vancouver Pier, Vancouver, B. C.—After a delay of nearly a year, construction of the new dock for the largest of the Canadian Pacific Railroad Empresses of the Pacific, at Vancouver, is to start at once; a 1,100-foot ocean pier that will represent the last word in modern port facilities and cost between $2,500,000 and $3,000,000 when completely equipped, to be constructed instead of the original 800-foot pier out to the present harbor headline, costing in the neighborhood of $2,000,000. The Northwestern Dredging Company has been awarded a contract for preliminary extension work involving a cost of $60,000.

Structural Steel, etc., New Orleans, La.—Sealed proposals were received by the Board of Commissioners of the Port of New Orleans, New Orleans Court Building, on January 17, for contracts in connection with the construction of a double-deck bridge and approach span, containing about 213 tons of structural steel, operating machinery and trim, for the ferry landing at the foot of Canal Street, New Orleans, as follows: Requisition E. D. 14393—Under one contract—Furnishing structural steel for ferry bridge with or without erection of bridge, of machinery and of trim; Requisition E. D. 14394—Under one contract—Erection of ferry bridge, of machinery and of trim; Requisition E. D. 14395—Under one contract—Furnishing ferry bridge machinery. J. H. Walsh, General Manager.

NEW INCORPORATIONS

The Munson Steamship Line has increased its capitalization from $4,000,000 to $6,000,000.

Mexican-American Fruit & Steamship Corporation, of Delaware has increased its capitalization to 20,000 shares, preferred stock, $100 each and 100,000 common.

Lake & Coal Corporation of New York, capital $100,000, incorporated at Albany. Incorporators: H. E. Moran and R. R. Conant; B. F. Spellman, 115 Broadway, attorney.

Pontin Boat Corporation, capital $50,000, chartered under Delaware laws. Incorporators: Patrick J. Dobson, Warren J. Eldridge and Charles P. Schroetter, of New York.

Pontin Lighterage and Transportation Corporation of Manhattan, capitalization of 500 shares, common stock, no par value, incorporated at Albany. Incorporators: J. A. Martin, P. J. Dobson and W. Shea.

Suffolk-Baltimore Steamship Company, of Suffolk, Va., capital ranging from $20,000 to $50,000, incorporated at Richmond, to operate a steamship line between Suffolk and Baltimore. Incorporators: D. K. Joyner, president; I. B. Powell, secretary; J. B. Pruden, John T. Freema and George A. Howerton, all of Suffolk.

MARINE SOCIETIES

AMERICA

American Society of Naval Engineers
Navy Department, Washington, D. C.
Secretary-Treasurer—Commander S. M. Robinson, U. S. N., Bureau of Engineering, Navy Department, Washington, D. C.

Society of Naval Architects and Marine Engineers
29 West 39th Street, New York
Secretary and Treasurer—Daniel H. Cox.

National Association of Engine and Boat Manufacturers
29 West 39th Street, New York City
Secretary—R. R. A. Hand.

United States Naval Institute
Naval Academy, Annapolis, Md.
Secretary and Treasurer—Commander H. K. Hewitt, U. S. N.

American Marine Association
15 Park Row, New York
President—Frank J. Shipman.

The New York Tow Boat Exchange
11 Moore St., New York.
Secretary—Irving G. Keller.

Port of New York Authority
11 Broadway, New York
Chairman—E. H. Outerbridge.
Secretary—William Leary.

National Association of Masters, Mates and Pilots
National Secretary—M. D. Tenniswood, 308 Vine St., Camden, N. J.

American Society of Marine Designers
Secretary—B. G. Barnes, 202 Kendrick Ave., Quincy, Mass.

National Marine Engineers' Beneficial Association
Headquarters 311-315 Machinists Building, Washington, D. C.
Secretary-Treasurer—George A. Grubb.

Atlantic Coast Shipbuilders' Association
1600 Walnut Street, Philadelphia, Pa.
Secretary—C. S. King.

American Steamship Owners' Association
11 Broadway, New York
President—Alfred Gilbert Smith.
Vice-President and General Manager—Winthrop L. Marvin.

United States Ship Operators' Association
149 Broadway, New York
President—C. H. Potter.

National Merchant Marine Association
Munsey Bldg., Washington, D. C.
President—Hon. J. E. Ransdell.

The Maritime Association of the Port of New York
78 Broad St., New York City
President—Charles H. Potter.
Secretary—Walter F. Firth.

Lake Carriers' Association
President—Wm. Livingstone, Dime Bank Building, Detroit, Mich.
Secretary—George A. Marr, Rockefeller Building, Cleveland, O.

Neptune Association
21 Pearl St., New York City
Secretary-Treasurer—Captain John F. Milliken.

Ocean Association of Marine Engineers
15 Whitehall St., New York City
Secretary—Bert L. Todd.

CANADA

Grand Council N. A. of M. E. of Canada
Grand Secretary-Treasurer—Neil J. Morrison, Box 886, St. John, N. B.

GREAT BRITAIN

Institution of Naval Architects
5 Adelphi Terrace, London, W. C.

Institution of Engineers and Shipbuilders in Scotland
39 Elmbank Crescent, Glasgow.

Northeast Coast Institution of Engineers and Shipbuilders
Bolbec Hall, Westgate Road, Newcastle-on-Tyne.

Institute of Marine Engineers, Incorporated
The Minories, Tower Hill, London.

ITALY

Collegio Degli Ingegneri Navali e Meccanici in Italia

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